TECHTRONICS

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DEPARTMENT OF ELECTRONICS ENGINEERING

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Message From HOD

Dr. Mrs. Sandhya Save

Once again, it's a moment of pride for the whole department of ELEX as we present the latest issue of our magazine "TECHTRONICS". This time around the magazine isn't just a regular one; it is much more exciting and much more innovative and informative. I appreciate my team for their sincere efforts in putting up such a beautiful magazine on the line. And I wish the radiance of ELEX keeps breaking old boundaries and set's up new limit, as we believe in aiming at stars…for sky is the limit for us.

Message From Faculty In-charge

Dr. S. C. Patil

The Electronics & Communication Engineering is one of the most dynamically changing and ever evolving branch since more than 100 years. Electronics is the foundation on which Information Technology and Computer Engineering has grown. Engineering with the latest tools such as VLSI Design, MATLAB , ARM CORTEX, LAB View, FPGA Board, to make students Industry ready. All high-speed networks and computers work on the hardware designed by electronic engineers.

21st century is the century of communication as communication engineering has been growing exponentially in recent years. At TCET, department of electronics Institute developed state-of–art laboratories & centres of excellence so as to train our students in Electronics Engineering through flexible, adaptive and progressive training programs, Bridge Courses, Various project in signal System and communication Domain and other Domains along with cohesive interaction with the research organizations, academicians and industries and having experience faculties in the department. It is my pleasure to work with imminent students who egger to develop the carrier in Electronics Engineering.

Message From IETE Faculty In-charge

Mrs. Archana L. Belge

As in today's world only bookish knowledge is not sufficient to stand oneself in the competitive word, we the Department of Electronics Engineering at TCET believe in overall development. We take care of the holistic development of students along with technical growth. We train students through various activities like Activity Based Learning (ABL); Project Based Learning (PBL); In-house Internship Programs, Workshops on upcoming technology and many more activities.

In ABL we encourage students to develop their personality through various activities like debate, extempore, group discussions etc. In PBL students are guided to prepare projects by identifying real world problems and applying computing fundamental and technical skill to find solution to them. In-house Internship Programs are where students learn different coding languages which makes them industry competent...

Professional Body activities are specially planned to make students ready for their professional career, through various activities like Workshops in looming technologies, Seminars, hands-on session up to date trend in Electronics, software and hardware in different platforms, industrial visits at various places to understand the upcoming requirements in industries. Professional Body is formed by the students for the students.

The Electronics Department Faculty believes in Great teachers.

"The mediocre teacher tells. The good teacher explains. The superior teacher demonstrates. The great teacher inspires." – William A. Ward

Words of wisdom

• "*Believe in yourself and all that are you. Know that there is something inside you that is greater than any obstacle*". --- by Christin D. Larson.

Mrs. Archana Belge
Assistant Professor

• There are always people who just work hard and people who work hard smartly. In order to rise above all other competitors, your approach to any problem should be in a systematic manner so that there's clarity regarding what to do and with the extent of priority to be given as well.
Hence my words of wisdom to all students are - "*BE SMART IN YOUR WORK METHODOLOGY & SET YOUR PRIORITIES STRAIGHT*".

Mr. Sunil Khatri
Assistant Professor

• As a teacher, We do not only see our self as having the responsibility to teach and impart knowledge about different subject matters to our students; but, We also strive to motivate them to aspire to achieve excellence, and the best in whatever they do.
Education is not a safety net. It is the rocket which will propel you towards success. All you have to do is have an aim and work on everything that takes to get a lift-off.

Mrs. Leena Chakraborty
Assistant Professor

• If you're trying to achieve something in your life there will be obstacles. I've had them, but obstacles shouldn't stop you from going ahead. If you see a big wall in front of you, don't turn around and give up. Find a way out how to climb it, go through it, or break it...
Life always comes with challenges, it's your choice whether to take it or leave it.

Mrs. Poorva Waingankar
Assistant Professor

Words of wisdom

• I will just say my true feelings, as I care about you all. What I feel is in today's scenario, patience and belief is disappearing from our lives. We are humans we need to preserve these two important principles of life. Yes, no doubt today's life style is responsible for this extinction. But as we know, each and every action in this world is a vice versa action. So you can understand what is to be done. Being ambitious doesn't mean to be mean. You are the future bring about the positive changes. Our scriptures are helpful in this and of course our parents and grandparents. God bless all of us.

Mrs. Sonal Barvey
Assistant Professor

• *"The difference between ordinary and extraordinary is that little extra." "Let your unique awesomeness and positive energy inspire confidence in others." "Wherever you go, no matter what the weather, always bring your own sunshine." "If you want light to come into your life, you need to stand where it is shining."*

Mr. Vaibhav V Gijare
Assistant Professor

• Education is not concerned with any ideology, nor is it based on any system, neither is it a mean of conditioning the individual in some special manner. Education in its true sense is helping the individual to be mature and free, to flower greatly in love and goodness. The highest function of education is to bring about an integrated individual who is capable of dealing with life as a whole.

Mrs. Jalpaben Pandya
Assistant Professor

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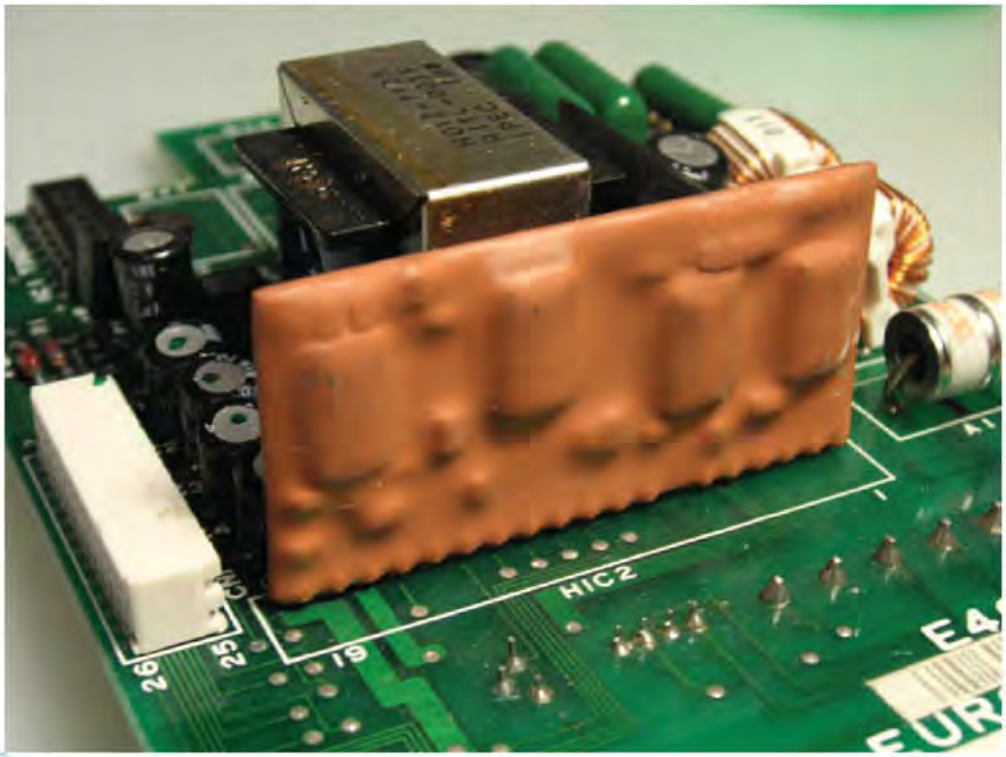
Technology Now

1. HYBRID INTEGRATED CIRCUIT(HIC)

A hybrid integrated circuit (HIC), hybrid microcircuit, hybrid circuit or simply hybrid is a miniaturized electronic circuit constructed of individual devices, such as semiconductor devices (e.g. transistors, diodes or monolithic ICs) and passive components (e.g. resistors, inductors, transformers, and capacitors), bonded to a substrate or printed circuit board (PCB).

Hybrid circuits are often encapsulated in epoxy, as shown in the photo. A hybrid circuit serves as a component on a PCB in the same way as a monolithic integrated circuit; the difference between the two types of devices is in how they are constructed and manufactured. The advantage of hybrid circuits is that components which cannot be included in a monolithic IC can be used, e.g., capacitors of large value, wound components, crystals, inductors.



An (orange-epoxy) encapsulated hybrid circuit on a printed circuit board.

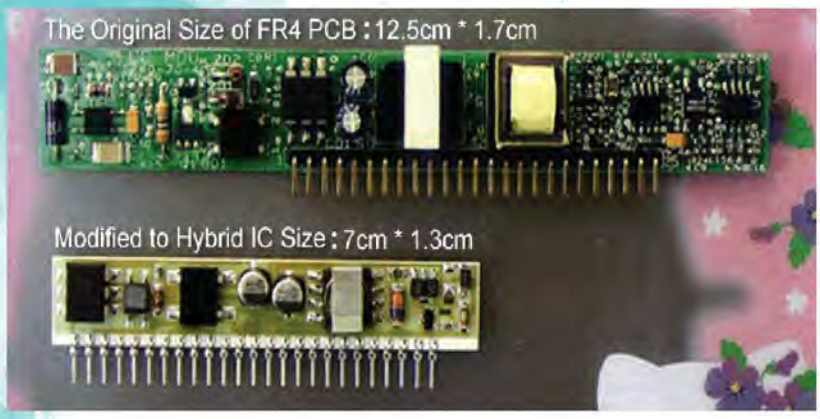
Comparison of Monolithic ICs VS Hybrid ICs:

Monolithic ICs	Hybrid ICs
Monolithic integrated circuits which are fabricated entirely on a single chip.	Hybrid integrated circuits are fabricated by interconnecting a number of individual chips.
A monolithic integrated circuit has the full circuit constructed on a single piece of silicon or other semiconductor, then enclosed in a package with connecting leads.	A Hybrid circuit often ceramic substrate carrying one or more silicon chips. A hybrid can also use mixed technology, such as GaAs chips along with silicon chips.
Small in size as compared to hybrid ICs	Large in size as compared to monolithic ICs
In this case all the component is formed together by various method which include diffusion or ion implantation.	In this case of hybrid integrated circuits, interconnection usually established by TEM mode transmission lines.
Monolithic ICs are expensive.	Hybrid ICs are less expensive.
Speed is high as compared to hybrid ICs.	Speed is low as compared to monolithic ICs.
Monolithic ICs provide smaller flexibility in circuit design.	Hybrid ICs provide greater flexibility in circuit design.

Based upon the method used to form the passive components and the related interconnections on the substrate, Hybrid Integrated Circuits (ICs) can be categorized into two types –

1. Thin Film ICs
2. Thick Film ICs

Thin Film ICs have film thickness varying from 50 to 20000 Armstrong units. The thin films are deposited using any of the technologies like vacuum evaporation, plating technique, sputtering and screening. These ICs have high-frequency packaging density and high component packaging density. Using this technology, resistors can be trimmed to precision values. This feature makes the Thin film ICs suitable for ladder type Digital to Analog Converters.



Some modern hybrid circuit technologies, such as LTCC-substrate hybrids, allow for embedding of components within the layers of a multi-layer substrate in addition to components placed on the surface of the substrate. This technology produces a circuit that is, to some degree, three-dimensional.

Advantages of Hybrid Integrated Circuit (HIC):

High frequency ranges: Ceramic provides a better dielectric conductivity. Therefore ceramic is the optimum substrate for all applications that operate in high frequency regions, such as Radar technology.

Extreme ambient temperature: Ceramic as a substrate has an excellent thermal conductivity – better than FR4. As a result, the temperature stability of your product is considerably increased.

High reliability: Ceramic is generally more suitable for rough ambient conditions, such as Oil or extreme climatic conditions. Furthermore, in a hybrid circuit with integrated resistors in thick layer circuits less mechanical connections are necessary than in the case of a PCB circuit. This mechanical strength provides an increased reliability even at high vibrations.

2. Nanotubes

Carbon nanotubes (CNTs) are tubes made of carbon with diameters typically measured in nanometres. Carbon nanotubes often refer to single-wall carbon nanotubes (SWCNTs) with diameters in the range of a nanometre. They were discovered independently by Iijima and Ichihashi and Bethune et al. in carbon arc chambers similar to those are used to produce fullerenes. Single-wall carbon nanotubes are one of the allotropes of carbon, intermediate between fullerene cages and flat graphene. Although not made this way, single-wall carbon nanotubes can be thought of as cut-outs from a two-dimensional hexagonal lattice of carbon atoms rolled up along one of the Bravais lattice vectors of the hexagonal lattice to form a hollow cylinder. In this construction, periodic boundary conditions are imposed over the length of this roll up vector to yield a lattice with helical symmetry of seamlessly bonded carbon atoms on the cylinder surface.

Diamond and graphite are considered as two natural crystalline forms of pure carbon. In diamond, carbon atoms exhibit sp3 hybridization, in which four bonds are directed towards the corners of a regular tetrahedron. The resulting three-dimensional network (diamond) is extremely rigid, which is one reason for its hardness.

Classification

Carbon nanotubes are classified in following two types: SWCNTs-Single-walled carbon nanotubes and MWCNTs-Multiple-walled carbon nanotubes.

Structure & Morphology

Comprised entirely of carbon, the structure of pure SWCNT can be visualized as rolled-up tubular shell of graphene sheet which is made up of benzene type hexagonal rings of carbon atoms. Graphene sheets are seamless cylinders derived from a honeycomb lattice, representing a single atomic layer of crystalline graphite. A MWCNT is a stack of graphene sheets rolled up into concentric cylinders. Each nanotube is a single molecule composed of millions of atoms and the length of this molecule can be tens of micrometres long with diameters as small as 0.7 nm. The SWCNTs usually contain only 10 atoms around the circumference and the thickness of the tube is only one-atom thick. Nanotubes generally have a large length-to-diameter ratio (aspect ratio) of about 1000, so they can be considered as nearly one-dimensional structures. MWCNTs are larger and consist of many single-walled tubes stacked one inside the other. The name MWCNT is restricted to nanostructures with outer diameter of less than 15 nm, above which the structures are called carbon nanofibers.

In addition to the two different basic structures, there are three different possible types of carbon nanotubes. These three types of CNTs are armchair carbon nanotubes, zigzag carbon nanotubes, and chiral carbon nanotubes. The difference in these types of carbon nanotubes are created depending on how the graphite is "rolled up" during its creation process. The choice of rolling axis relative to the hexagonal network of **the grapheme** sheet and the radius of the closing cylinder allows for different types of SWCNTs.

Carbon Nanotubes Synthesis Techniques

High-quality nanotube materials are desired for both fundamental and technological applications. High quality refers to the absence of structural and chemical defects over a significant length scale (e.g., 1-10 microns) along the tube axes. The number of patents and publication on the synthesis of carbon nanotube is increasing rapidly. However there are many challenges remaining that must be resolved regarding synthesis of CNT. Currently, there are four main challenges in the field of nanotube synthesis.

(a) Mass production, that is, the development of low-cost, large-scale processes for the synthesis of high-quality nanotubes, including SWCNTs.

(b) Selective production, that is, control over the structure and electronic properties of the produced nanotubes.

(c) Organization, that is, control over the location and orientation of the produced nanotubes on a flat substrate.

(d) Mechanism, that is, the development of a thorough understanding of the processes of nanotube growth. The growth mechanism is still a subject of controversy, and more than one mechanism might be operative during the formation of CNTs.

Applications

A primary obstacle for applications of carbon nanotubes has been their cost. Prices for single-walled nanotubes declined from around $1500 per gram as of 2000 to retail prices of around $50 per gram of as-produced 40–60% by weight SWNTs as of March 2010. As of 2016, the retail price of as-produced 75% by weight SWNTs was $2 per gram. SWNTs are forecast to make a large impact in electronics applications by 2020 according to The Global Market for Carbon Nanotubes report.

Current use and application of nanotubes has mostly been limited to the use of bulk nanotubes, which is a mass of rather unorganized fragments of nanotubes. Bulk nanotube materials may never achieve a tensile strength similar to that of individual tubes, but such composites may, nevertheless, yield strengths sufficient for many applications. Bulk carbon nanotubes have already been used as composite fibers in polymers to improve the mechanical, thermal and electrical properties of the bulk product.

3. Rust Coding

```
fn main() {
  let i =0;
  while i<= 10 {
   io::println(factorial(i));
    i = i+ 1;
  }
}
```

Introduction

Rust is an open-source systems programming language that focuses on speed, memory safety and parallelism. It is a multi-paradigm system programming language focused on safety, especially safe concurrency. Rust is syntactically similar to C++, but is designed to provide better memory safety while maintaining high performance.

Rust was built from scratch and incorporates elements from tried-and-true systems programming languages and modern programming language design. It fuses the expressive and intuitive syntax of high-level languages with the control and performance of a low-level language. It also prevents segmentation faults and guarantees thread safety.

This empowers developers to write code that is ambitious, fast and correct. Developers are using Rust to create a wide range of new software applications, such as game engines, operating systems, file systems, browser components and simulation engines for virtual reality. An active community of volunteer coders maintains the Rust code base and continues to add new enhancements. Mozilla sponsors the Rust open source project.

Rust has been the "most loved programming language" in the Stack Overflow Developer Survey every year since 2016.

Beginning of RUST

Rust was originally designed by Graydon Hoare at Mozilla Research in 2006, with contributions from Dave Herman, Brendan Eich, and others. The designers refined the language while writing the Servo layout or browser engine, and the Rust compiler.

The compiler is free and open-source software dual-licensed under the MIT License and Apache License 2.0.

The language, like the Rust fungus it is named after, is starting to spread, and today is used to build software for the web, embedded computers, distributed services, and the command line.

Similarity to C and C++

The concrete syntax of Rust is similar to C and C++, with blocks of code delimited by curly brackets, and control flow keywords such as if, else, while, and for. Not all C or C++ keywords are implemented, however, and some Rust functions, such as the use of the keyword match for pattern matching, will be less familiar to those versed in these languages.

Despite the superficial resemblance to C and C++, the syntax of Rust in a deeper sense is closer to that of the ML family of languages and the Haskell language. Nearly every part of a function body is an expression, even control flow operators.

Rust is a programming language that offers the performance of C and C++ but with safeguards to stop developers shooting themselves in the foot.

Why RUST?

Carol Nichols, from the Rust programming language core team and co-author of The Rust Programming Language book, says-

"The biggest strength of Rust is that it's an empowering technology. To write extremely fast code with a low memory footprint previously meant using C or C++. However, using those languages in production code requires you to manage memory manually and know all the ways you might cause undefined behaviour. The Rust compiler is stricter and makes sure you're using memory safely so that you can concentrate on the problem you're really trying to solve."

On top of this, Rust adds the quality of life features of some higher-level languages.

There are hundreds of companies using Rust in production, such as Dropbox, Yelp, and Cloudflare. Products like Amazon's recently announced virtualization technology Firecracker are being created with Rust, with new production deployments regularly added to this page.

That said, use of Rust is generally still at an early stage, and employers aren't crying out for Rust skills at present, with the language not featuring in global job site Indeed's top tech languages for the US in 2018.

Applications of RUST

In 2018, the Rust community decided to improve programming experience for a few distinct domains like-

1. Terminal Command Line for building tools

2. Web Assembly for writing Web Apps
3. Networking
4. Working on Servers
5. Embedded System

Rust can build powerful web apps

Rust increasingly looks like a decent choice for building web apps that offer performance that wouldn't have been possible using JavaScript, the longstanding scripting language of the web.

Rust is good for building distributed online services

For networked services, Rust's minimal footprint and ability to ensure memory safety across multiple threads make it a great choice for services that scale across distributed systems online.

Rust is suited to creating powerful, cross-platform command-line tools

Rust now has new developer tools and better IDE support

A range of developer tools are now out of preview, including Rustfmt, a tool for automatically formatting code based on a default code style; Clippy for helping ensure idiomatic code style; Rust's linter for highlighting potential bugs; and support in IDEs via Rust Language Server and IntelliJ Rust.

Existing tools are also improved, such as the borrow checker that helps ensure code is memory safe, which has been made more forgiving so it won't block other borrowers from using data if a variable is finished using that value.

RUST for Embedded System

Embedded Rust is for everyone who wants to do embedded programming while taking advantage of the higher-level concepts and safety guarantees the Rust language provides.

The term Embedded Programming is used for a wide range of different classes of programming. Ranging from programming 8-Bit MCUs (like the ST72325xx) with just a few KB of RAM and ROM, up to systems like the Raspberry Pi (Model B 3+) which has a 32/64-bit 4-core Cortex-A53 at 1.4 GHz and 1GB of RAM. Different restrictions will apply when writing code depending on what kind of target is used. There are two general Embedded Programming classifications:

1. **Hosted Environments**

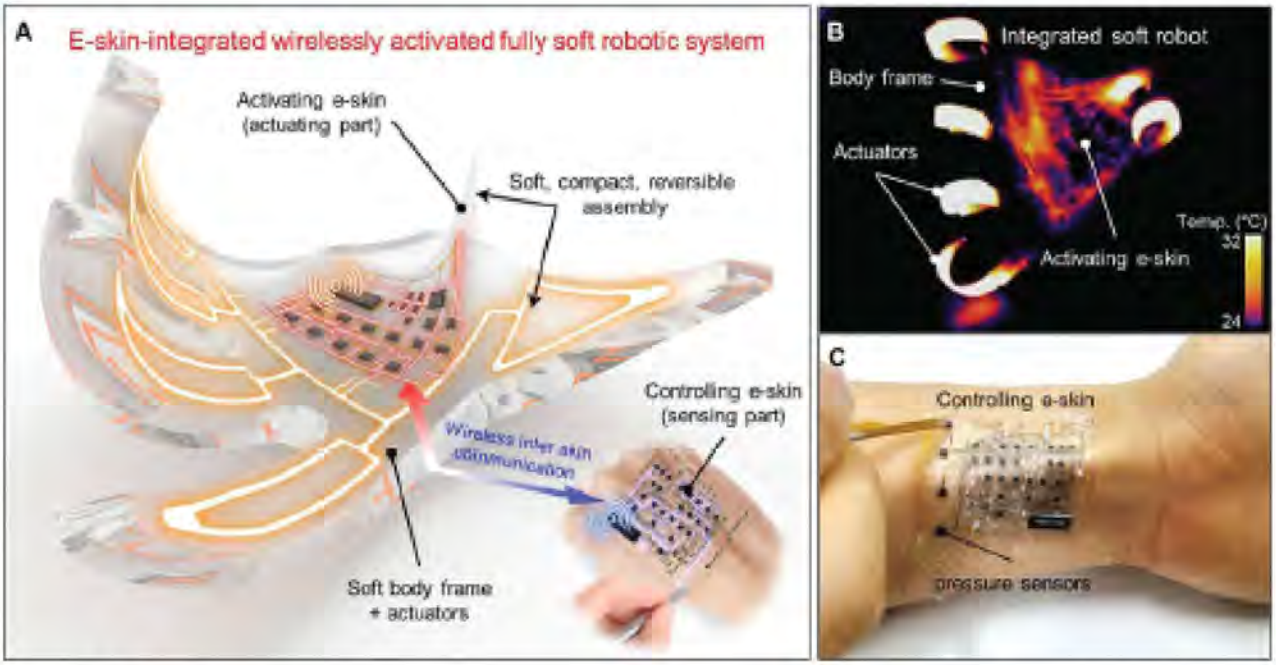
These environments are close to a normal PC environment. This means that you are provided with a System Interface- E.G. POSIX- that provides you with primitives to interact with various systems, such as file systems, networking, memory management, threads, etc. Standard libraries in turn usually depend on these primitives to implement their functionality. So, it feels

like coding on a special-purpose PC environment.

2. Bare Metal Environments

In a bare metal environment, no code has been loaded before your program. Without the software provided by an OS we cannot load the standard library. Instead the program, along with the crates it uses, can only use the hardware (bare metal) to run. The platform-agnostic parts of the standard library are available through libcore, which also excludes things which are not always desirable in an embedded environment. One of these things is a memory allocator for dynamic memory allocation. If you require this or any other functionalities there are often crates which provide these.

4. Flexible Electronics



Definitions:

Flexible electronics generally refers to a technology where electronic devices are built on stretchable substrates like plastic, metal foil, paper and flex glass.

or

Flexible Hybrid Electronics (FHE) is printed electronics on silicon based integrated active circuits on a stretchable substrate.

Flexible electronics are also known as flex circuits. Here the desired electronic circuit is built by mounting electronic devices on flexible substrates such as polyimide, PEEK or transparent conductive polyester film. Flex circuits also can be screen printed silver circuits on polyester.

The manufacturing does not require new equipment as tools used for rigid printed circuit boards can be used. Etching techniques is another alternate way to thin down the traditional silicon substrate to a few tens of micrometres to gain reasonable flexibility, called as flexible silicon. Other classes of graphene like 2D materials such as transition-metal dichalcogenide(TMD) materials and boron nitride(BN), apart from carbon can be used in flex circuits. Large manufacturing of graphene is feasible but the damage inflicted during substrate production is unavoidable and ultimately compromising the performance of device.

Advantages:

1. Reduces size and weight of any electric device considerably,
2. Sine folding the circuits is possible the designing, transporting and packaging has many options,
3. Increased circuit density eliminates bulky connections and wiring
4. Less restrictions on shape and size.

Disadvantages:

1. Expensive products,
2. Repairing becomes complicated,
3. Wiring quality decreases,
4. Increased risk of damage while handling.

Applications of flexible circuits:

1. Most of the flexible circuits are made to act as interconnections between electronic components such as integrated circuits and resistors or capacitors,
2. In switch matrix of a computer keyboard,
3. In flexible organic light -emitting diode displays,
4. In Automobile industries, these are used in instrument panels, under-hood controls and in ABS,
5. In moving print head of printers ,
6. In Personal exercise monitors,
7. In Medical devices where compact interconnections are required,
8. Flexible solar cells have been realized and make it possible to tap solar energy by easy deployment.

Future scope of flexible circuits:

1. Printable solar panels,
2. Roll up TVs,
3. Smart windows that adjust the amount of sunlight that enters while creating solar energy,
4. Intelligent patches: stick on patches that monitor the functioning of human body, detection of any illegal substance inside a packet.

5. Spintronics

What is Spintronics?

Spintronics or spin electronics is the study of the role that is played by the spin of an electron in the solid state physics and other devices that exploit spin properties. It is also called as spin Flextronics. This deals with how the intrinsic spin of electronics and its resulting magnetic moments can be applied for evolving technology in other words, it taps on effects of electrons spinning in orbits around the nucleus-for examples-spin transport and spin relaxation.

Spintronics emerged from discoveries in the 1980s concerning spin-dependent electron transport phenomena in solid-state devices. This includes the observation of spin-polarized electron injection from a ferromagnetic metal to a normal metal.

How Spintronics works?

- The spin of the electron is an intrinsic angular momentum that separates from the angular momentum due to its orbital motion.
- Like orbital angular momentum, the spin has an associated magnetic moment.
- In a solid, the spins of many electrons can act together to affect the magnetic and electronic properties of a material, for example endowing it with a permanent magnetic moment as in a ferromagnet. In many materials, electron spins are equally present in both the up and the down state.
- A spintronic device requires generation or manipulation of a spin-polarized population of electrons, resulting in an excess of spin up or spin down electrons.

- A net spin polarization can be achieved either through creating an equilibrium energy split between spin up and spin down. Methods include putting a material in a large magnetic field (Zeeman effect), the exchange energy present in a ferromagnet or forcing the system out of equilibrium.
- Manipulating the equilibrium, spin up ,spin down and total spin polarization by different methods like: supplying heat to the material, Sound waves made of diamond resonator or magnetic or electron field makes the study of electron spin movements and its applications.

Applications of Spintronics:

- Spintronic devices are used in the field of mass-storage devices. Massive compressed data is stored in small area. Data can be stored in the way an electron spins i.e. by changing angular moments or electron spin and such according to data that has to be stored.
- Cancer or any such abnormal growth of tissues and cells in living body can be detected using spintronics.
- Quantum computing and Neuromorphic computing.

Future Scope in Spintronics:

- Creation of spin polarization through optical or magnetic injection,
- Spin-polarized Transport through semiconductor/superconductor interfaces,
- Spin relaxation in metals and semiconductors,
- Spin-based devices such as PN junctions and amplifiers,

Spintronic application In Detail:

1)GMR

- Giant magnetoresistance (GMR) is a magnetoresistance effect observed in multilayers composed of alternating ferromagnetic and Non-magnetic material.
- It works when a significant change in electrical resistance occurs in ferromagnetic layer , and depends on magnetization of these layers in parallel or anti-parallel alignment.
- The overall resistance is relatively low for parallel alignment and relatively high for antiparallel alignment.
- The magnetization direction can be controlled, for example, by applying an external magnetic field.

The main application of GMR is magnetic field sensors, which are used to read data in hard disk drives, biosensors, microelectromechanical systems (MEMS).

A typical GMR-based sensor consists of seven layers:

1. Silicon substrate.
2. Binder layer.
3. Sensing (non-fixed) layer.
4. Non-magnetic layer.
5. Fixed layer.
6. Antiferromagnetic (Pinning) layer.
7. Protective layer.

Types of GMR:

1. Antiferromagnetic superlattices.
2. Spin valves using exchange bias.
3. Non interacting multilayers.
4. Inverse GMR effect.
5. GMR in granular structures.

2)SCANNER FOR CANCER DETECTION:

The Spintronic scanning technique is an efficient technique used in the medical field to detect cancer cells. Cancer cells are easy to be identified only when they are large in number. These cells when matured results in formation of tumour, which has to be removed by surgery. After surgery there may be presence of even a single cancer cell, which would result in growth of tumour in effected part of the body, which can be rectified by spintronics.

A Patient is exposed to a strong magnetic field so that his body cell gets magnetized. A beam of electrons with polarized spin is introduced on the unaffected part of the body and the change in spin is detected by a polarimeter .A beam of electrons with polarized spin is introduced on the part which had undergone surgery. The difference in spin of electrons when introduced to normal area and abnormal area indicates whether cancer cells have been removed from the body. If not, it indicates the presence of traces of cancer cells and it has to be treated again for ensuring complete safety to the patient. Thus this technique efficiently identifies the presence of cancer cells in that part of the body that has undergone surgery to prevent any further development.

Technical Terms:

Angular Momentum: the quantity of rotation of a body, product of a body's moment of inertia and its angular velocity.

Equilibrium: A state in which opposing forces or influencers are balanced.

Ferromagnet: substance that displays behaviour similar to magnets when magnetic field is applied across it.

Intrinsic: belonging to a thing by its very nature.

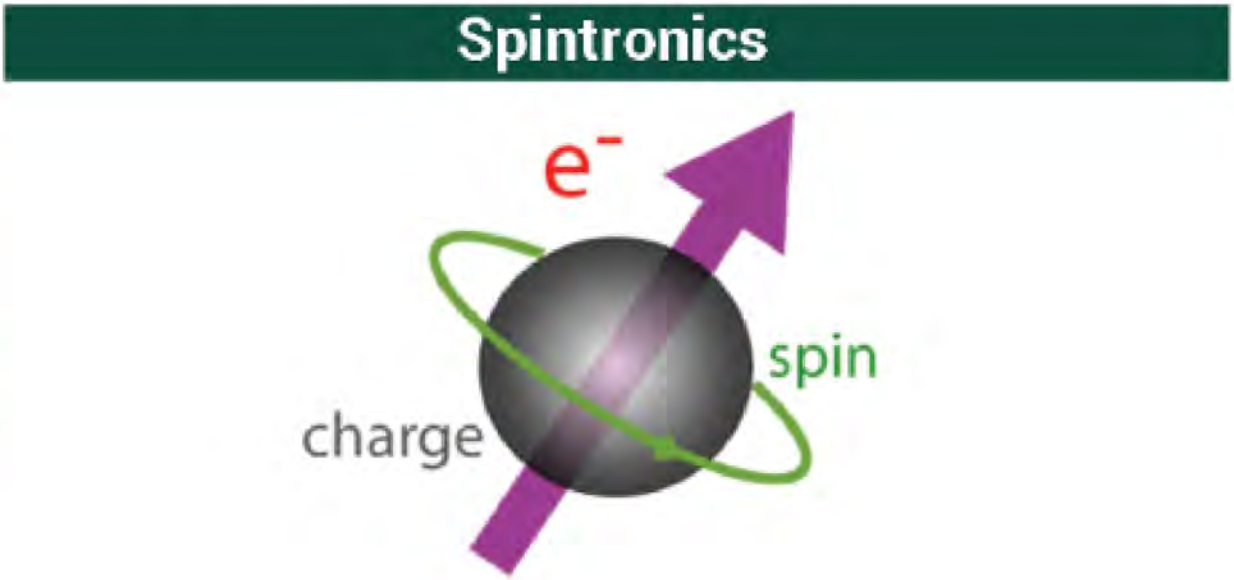
Magnetic Moment: is the magnetic strength and orientation of a magnet or other object that procedures a magnetic field.

Quantam computing: computing technology based on quantum theory, which explains the behaviour of energy and material on atomic and subatomic levels.

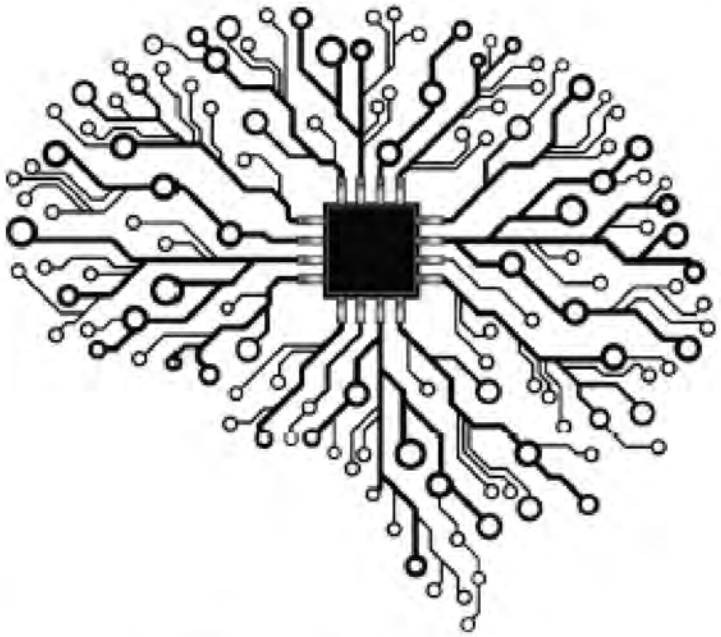
Spin polarized :is the degree to which the spin is aligned with a given direction.

Superlattices: an ordered arrangement of certain atoms in a solid solution which is superimposed on the solvent crystal lattice.

Zeeman effect: the splitting of a spectrum line into several components by the application of a magnetic field.



6. Neuromorphic Engineering



What is Neuromorphic engineering?

Neuromorphic Engineering or Neuromorphic Computing involves the development of components whose functions are analogous to parts of the brain, or at least to a minimum level of functionality similar to its natural counterpart. The main aim of creating such a device is to understand better how the brain. This would also enable us to produce or mimic how humans learn things from the perspective of brain, leading us to make superior machines that can learn to arrange themselves, to recognize patterns and with minimal inputs compared to digital neuron network would require. A neuromorphic device when realized will have components that can self-assemble. They involve atomic switches whose magnetic junctions would portray the role of synapses, or the connections between neurons. Machines that have such arrangement will have a fixed task than being general-purpose computers taking their instructions from micro-processors and micro-controller.

Moore's law that states that the number of transistors on a chip will double every 12 to 18 months to attain performance gains. This Law would have been redundant about 2 decades ago if the neuromorphic concept was given as much importance as now.

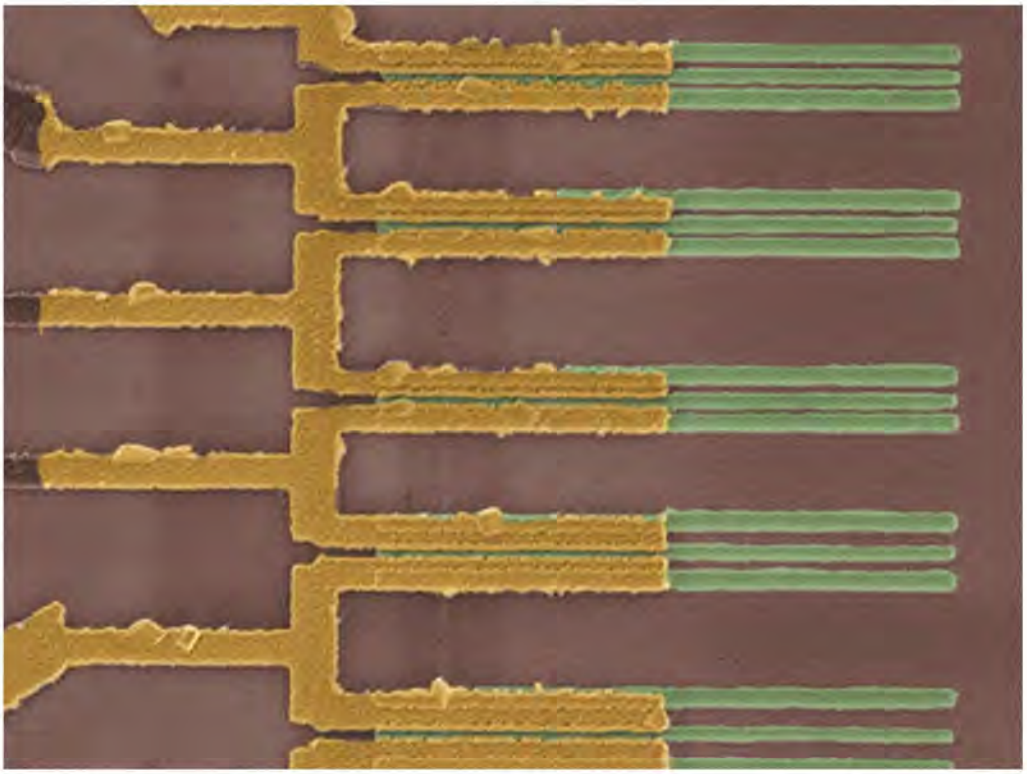
Disadvantages of Moore's law when implemented:

- With each new smaller chip generation, the efficiency of all wires within degrades.
- Previously, all the logic gates could be communicated with in a single clock cycle. Now this cannot be achieved.

Examples of neuromorphic engineering projects under way to produce working, reproducible neuromorphic model:

- A low-grade supercomputer designed by German engineers simulates the cortical microcircuits function. It is believed that SpiNNaker performed the largest neural network simulation, involving about 80,000 neurons connected by 300 million synapses.
- Loihi, a Neuromorphic chip architecture proposed by Intel, is mainly for training a neural net. It is designed to implement a spiking neural network (SNN), whose model adds more brain like characteristics.
- A Neuromorphic Devices and Architecture's project under IBM has demonstrated its non-volatile phase-change memory accelerated the feedback or backpropagation algorithm associated with neural nets. They are trying to implement Phase change memory in modelling synthetic synapses, replacing SRAM based arrays used earlier.

Gimzewski's research shows the photograph of a grid of copper posts at near-micron scale, that have been treated with a silver nitrate solution. When gaseous Sulphur comes in contact with this, the silver atoms from nanowires from point to point on the grid wires which behave like synapses. According him , when the dimensions of the copper posts were changed, some instabilities that occur on the larger scale could be avoided. As a result, good quality nanowire structures were obtained.



IBM's carbon nanotubes could serve as a replacement to silicon.

Why neuromorphic engineering requires a new class of machine?

To understand this better, let us consider the chess game in computers with one player being the computer itself. This is the decision tree, the basic forms of Artificial intelligence. It is very simple to understand and has nothing like the brain's decision making. The decision tree algorithm applies numeric values to assessed possibilities. The game logic evaluates all the future possibilities for moves, counter-moves and counter-counter-moves and selects the best assessed possibility.This process of converting these evaluations into automated response patterns, very roughly can be referred to as – a strategy. Changing the strategy to different inputs is called -learning. Google's DeepMind unit is one example of a research project that applies purely mathematical logic to the task of machine learning, including this example involving modelling responses to multiple patients' heart and lung behaviour.

The machines required to simulate the behaviour of brain and organs in the same manner in terms of preciseness, quickness with ability to clone 'learning' of humans. To meet such requirements, we need new efficient class of computers and machines.

Can Neuromorphic engineering actually work as good as its organic counterpart?

Many neurologists and biotechnicians claim that any model of neuromorphic engineering is incompetent and will always have disadvantages compared to that of an actual brain part, the system replicates.

Dr. Gerard Marx, CEO of Jerusalem-based research firm MX Biotech Ltd., Explains the analogy of brain and its connections to an infinite tropical rainforest resembling to dense matter, where trees are similar to neurons attached to synapses in open breeze. Marx points out that a biological set up as such will have a substance called as extracellular matrix(nECM), which is an active agent in recall process of brain. He further states that for memory the brain requires neurons, nCEM and a variety of dopants in nECM such as neurotransmitters.It is believed that electrochemical processes take place between these three elements which is very closely aligned with emotions. When a memory is recalled , the physiological effects associated like heavier breathing and raise in blood pressure trigger psychic effects example:- excitement, fear which in turn have a reinforcing effect on the memory itself. Marx along with his colleague Chaim Gilon comment on this as:We find ourselves in the inverse position of the boy who cried: "The emperor has no clothes!" as we exclaim: "There are no naked neurons!" They are swaddled in nECM, which is multi-functional, as it provides structural support and is a hydrogel through which liquids and small molecules diffuse. It also performs as a "memory material," as outlined by the tripartite mechanism which identifies NTs as encoders of emotions.

This concludes that the brain and its complex environment cannot be replicated with all its functionality even with the most advanced technology available.

Technical Terms:

Synapses: a junction between two nerve cells, consisting of a minute gap across which impulses pass by diffusion of a transmitter

SRAM (Static Random Access Memory): type of memory chip which is faster and requires less power than dynamic memory.

Spiking neural network: are artificial neural networks that more closely mimic neural networks.

Cortical microcircuits: Circuits that act similar to the outer layer of cerebrum.

7. Climate Change: Solar Energy trapping liquid to rescue?

Compared to fossil fuels, solar power has always lagged in terms of cost and efficiency. Though neither of energy types provide a clear cut solution for long-term power storage.

Scientists in Sweden have a solution for this. In the past year alone, a series of four papers has ushered in an intriguing new solution.

A 'solar thermal fuel fluid': It is like a rechargeable battery, but instead of electricity, you put sunlight in and get heat out, triggered on demand.

This molecule is composed of carbon, hydrogen and nitrogen, and when it is hit by sunlight, it does something unusual: the bonds between its atoms are rearranged and it turns into an energized new version of itself, called an isomer.

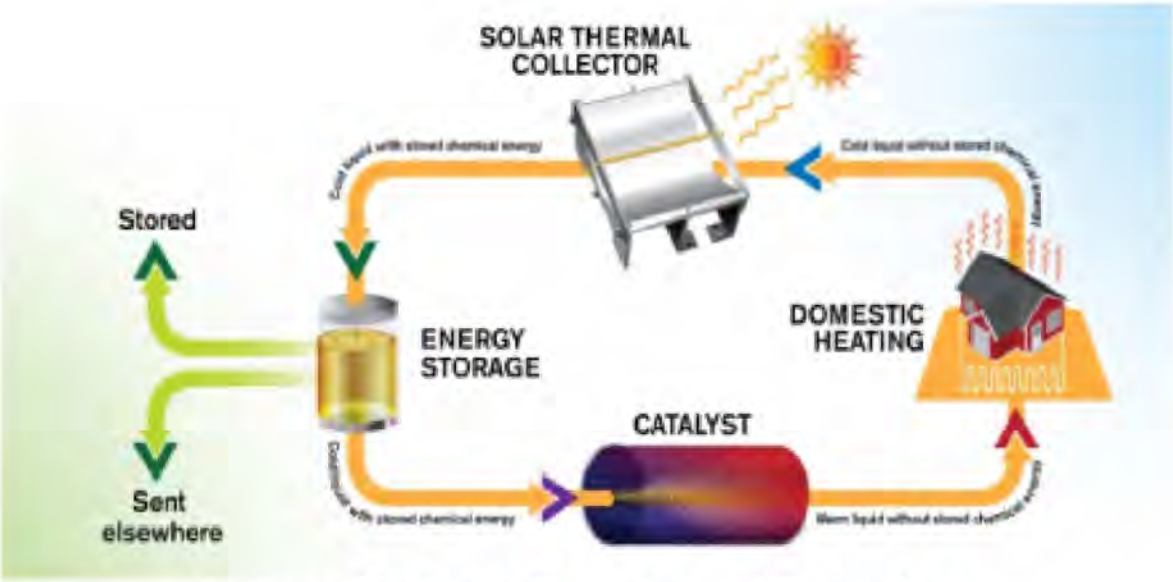
Scientist Kasper Moth-Poulsen from Chalmers University explains this technique saying,"Like prey caught in a trap, energy from the sun is thus captured between the isomer's strong chemical bonds, and it stays there even when the molecule cools down to room temperature. When the energy is needed - say at nighttime, or during winter - the fluid is simply drawn through a catalyst that returns the molecule to its original form, releasing energy in the form of heat. The energy in this isomer can now be stored for up to 18 years."

And when we come to extract the energy and use it, we get a warmth increase which is greater than we dared hope for, he explains.

A prototype of the energy system, placed on the roof of a university building, has put the new fluid to the test, and according to the researchers, the results have caught the attention of numerous investors. The renewable, emissions-free energy device is made up of a concave reflector with a pipe in the centre, which tracks the Sun like a sort-of satellite dish. The system works in a circular manner.Pumping through transparent tubes, the fluid is heated up by the sunlight, turning the molecule norbornadiene into its heat-trapping isomer, quadricyclane. The fluid is then stored at room temperature with minimal energy loss.

When the energy is needed, the fluid is filtered through a special catalyst that converts the molecules back to their original form, warming the liquid by 63 degrees Celsius (113 degrees Fahrenheit).

"We have made many crucial advances recently, and today we have an emissions-free energy system which works all year around," says Moth-Poulsen.



Source: Chalmers University of Technology

After a series of rapid developments, the researchers claim their fluid can now hold 250 watt-hours of energy per kilogram, which is double the energy capacity of Tesla's Powerball batteries, according to the NBC.

But there's still plenty of room for improvement. With the right manipulations, the researchers think they can get even more heat out of this system, at least 110 degrees Celsius (230 degrees Fahrenheit) more."There is a lot left to do. We have just got the system to work. Now we need to ensure everything is optimally designed," says Moth-Poulsen.

If all goes as planned, Moth-Poulsen thinks the technology could be available for commercial use.

The liquid is pumped through the transparent tubes to be absorbed by the sun. As it heats, it changes from its initial form of the molecule norbornadiene into its heat-trapping isomer, quadricyclane. The energy filled liquid is then stored at the room temperature. When demand for energy occurs, the liquid is passed through a catalyst which turns the molecules to their previous state raising the temperature by 63-degree Celsius. This fluid can then be used for household purposes such as heating systems and powering some equipment like a water heater, cloth dryer and more. After all this, the liquid is pumped back to the rooftop to repeat the cycle. Researchers have so far performed the process more than 125 times without any significant damage to the molecule. This can be a pretty neat solution for storing alternative energy in the future!

8. Silicon-Germanium Devices

Silicon-germanium is an important material that is used for the fabrication of SiGe heterojunction bipolar transistors and strained Si metal-oxide-semiconductor (MOS) transistors for advanced complementary metal-oxide-semiconductor (CMOS) and BiCMOS (bipolar CMOS) technologies. It also has interesting optical properties that are increasingly being applied in silicon-based photonic devices. The key benefit of silicon-germanium is its use in combination with silicon to produce a heterojunction. Strain is incorporated into the silicon-germanium or the silicon during growth, which also gives improved physical properties such as higher values of mobility.

The primary property of Si1−xGe x that is of interest for bipolar transistors is the band gap, which is smaller than that of silicon and controllable by varying the germanium content. Band-gap engineering concepts, which were previously only possible in compound semiconductor technologies, have now become viable in silicon technology. These concepts have introduced new degrees of freedom in the design of bipolar transistors that have led to dramatic improvements in transistor performance. In Si1−xGe x heterojunction bipolar transistors (HBT s), the Si1−xGe x layer is incorporated into the base and the lower band gap of Si1−xGe x than Si is used to advantage to dramatically improve the high-frequency performance.

Applications

SiGe allows CMOS logic to be integrated with heterojunction bipolar transistors, making it suitable for mixed-signal circuits. Heterojunction bipolar transistors have higher forward gain and lower reverse gain than traditional homojunction bipolar transistors. This translates into better low current and high frequency performance. Being a heterojunction technology with an adjustable band gap, the SiGe offers the opportunity for more flexible band gap tuning than silicon-only technology.

Silicon Germanium-on-insulator (SGOI) is a technology analogous to the Silicon-On-Insulator (SOI) technology currently employed in computer chips. SGOI increases the speed of the transistors inside microchips by straining the crystal lattice under the MOS transistor gate, resulting in improved electron mobility and higher drive currents. SiGe MOSFETs can also provide lower junction leakage due to the lower band gap value of SiGe. However, a major issue with SGOI MOSFETs is the inability to form stable oxides with silicon germanium using standard silicon oxidation processing.

Low-k Dielectric

In semiconductor manufacturing, a low-κ is a material with a small relative dielectric constant (κ, kappa) relative to silicon dioxide. Low-κ dielectric material implementation is one of several strategies used to allow continued scaling of microelectronic devices, colloquially referred to as extending Moore's law. In digital circuits, insulating dielectrics separate the conducting parts (wire interconnects and transistors) from one another. As components have scaled and transistors have gotten closer together, the insulating dielectrics have thinned to the point where charge build up and crosstalk adversely affect the performance of the device. Replacing the silicon dioxide with a low-κ dielectric of the same thickness reduces parasitic capacitance, enabling faster switching speeds and lower heat dissipation. In conversation such materials may be referred to as "low-k" (spoken "low kay") rather than "low-κ" (low-kappa).

Silicon on Insulator

In semiconductor manufacturing, silicon on insulator (SOI) technology is fabrication of silicon semiconductor devices in a layered silicon–insulator–silicon substrate, to reduce parasitic capacitance within the device, thereby improving performance. SOI-based devices differ from conventional silicon-built devices in that the silicon junction is above an electrical insulator, typically silicon dioxide or sapphire (these types of devices are called silicon on sapphire, or SOS). The choice of insulator depends largely on intended application, with sapphire being used for high-performance radio frequency (RF) and radiation-sensitive applications, and silicon dioxide for diminished short-channel effects in other microelectronics devices. The insulating layer and topmost silicon layer also vary widely with application.

Silicon-tin

Silicon-tin or SiSn, is in general a term used for an alloy of the form Si(1-x)Snx. The molecular ratio of tin in silicon can vary based on the fabrication methods or doping conditions. In general, SiSn is known to be intrinsically semiconducting, and even small amounts of Sn doping in silicon can also be used to create strain in the silicon lattice and alter the charge transport properties

9. Sustainable Stock Exchange (CSR)

Launched by the UN Secretary General in 2009 in New York, the Sustainable Stock Exchanges (SSE) initiative is a peer-to-peer learning platform for exploring how exchanges, in collaboration with investors, regulators, and companies, can enhance corporate transparency and ultimately performance on ESG (environmental, social and corporate governance) issues and encourage sustainable investment. The SSE is organized by the UN Conference on Trade and Development (UNCTAD), the UN Global Compact, the UN Environment Program Finance Initiative (UNEP FI), and the Principles for Responsible Investment (PRI).

Implementation methodologies

Stock Exchanges are invited to make a voluntary public commitment to advancing sustainability, thereby becoming an "SSE Partner Exchange". The SSE's global network of stock exchanges is then called upon to engage in various SDG-themed work-streams coordinated by the SSE organizers. These work-streams take the form of three pillars of interrelated activities: high-level consensus building, research and capacity building. The initiative advances sustainability measures throughout its network by promoting the sharing, adoption and implementation of best practices. Sustainability and Sustainable Development have emerged as the most important goals of the world today. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. These 17 Goals build on the successes of the Millennium Development Goals, while including new areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. They provide clear guidelines and targets for all countries to adopt in accordance with their own priorities and the environmental challenges of the world at large. The overarching goal of sustainability has led to a growing pressure on nations and various stakeholders in meeting the SDGs. Stock Exchanges play a key role in determining the health of a business and economy. They provide a central point for the interaction between investors, companies, policymakers and regulators. The stock exchanges recognizing this have evolved to meet the SDG's through developing sustainability indices and incorporating sustainability reporting and practices.

Today, exchanges are also well suited to help with the 21st century sustainable development challenge. They are uniquely placed to facilitate action as regards sustainable business, with a variety of measures at their disposal. These include listing requirements related to sustainability reporting, voluntary initiatives, guidance documents and training for both companies and investors, and sustainable investment products such as indexes that focus on ESG issues. The diversity of stock exchanges around the world makes reviewing their sustainability initiatives a challenge. Comparability is difficult due to wide differences in the regulatory powers that exchanges possess, which can range from significant (comparable to securities regulators) to moderate to non-existent. In virtually all markets, however, exchanges maintain significant 'soft-power' in terms of their ability to influence market participants through voluntary schemes. Exchanges have a number of motivating factors for the promotion of sustainability reporting initiatives.

A 2013 survey of exchanges by EIRIS found that key motivations included:

• To improve the environmental, social and corporate governance performance of companies

listed on their exchanges.

• To encourage and to help investors engage with companies on sustainability issues.

• To identify themselves in the marketplace as committed to sustainability.

• To foster improved company performance, with the aim of promoting the sustainable long-term viability of companies, and the market and stock exchanges themselves, and to that end an interest in the latest research that explores links between long- term financial performance and ESG issues.

The benefits of breaking barriers

There has long been a call for bridging the barrier between sustainability and investor relations. A recent report by Sustainability, Closing the Sustainability-Investor Relations Gap, makes the case for stronger internal engagement between sustainability and investor relations departments.

It outlines five points of misalignment between sustainability strategy and IR teams:

1. Differing language used to describe and measure company performance.

2. Investors desiring short-term results while sustainability teams focus on issues that play out over the medium- to long-term.

3. Inadequate mutual comprehension and technical capacity in the respective disciplines of IR and sustainability.

4. Lack of strong relationships between IR and sustainability team members

5. Not enough staff or resources to integrate sustainability data to investor communications.

Yet healing this divide benefits all parties and boosts profits, Sustainability says. And robust ESG reporting would attract new long-term investors seeking deeper business risk and opportunity analysis and who want to understand the business's social and environmental context. Plus, sustainability teams with a good knowledge of investor needs would tailor their reporting to be more relevant and clearly communicate the financial value of their efforts. A company would gain greater trust and credibility with investors, as well as reduce the effort and time needed to respond to investor surveys and ad-hoc inquiries relating to sustainability. Furthermore, according to Sustainability, "Stock exchanges and other governing bodies are increasingly making changes to their requirements for corporate disclosure on these issues."

10. Conversational Marketing In E-Commerce

With the rise of voice technology and chat bots, consumers now expect the ability to ask specific product questions whenever and wherever they shop. Conversational commerce allows brands to interact with customers directly during their buying journey. Shoppers can ask questions and get personal and direct response and recommendations. This immediate feedback can go a long way to nurturing long-term relationships and driving sales and loyalty. Where these conversations take place is critical. Embedding a chat box directly on a retailer's product detail page allows a customer to easily click to chat with product experts. Consumers can get the help they need, exactly when they need it - straight from the product experts at the brand.Busy retailer ecommerce sites, like Walmart.com and Target.com, have already adopted these tactics. Different investors from different industries have faith in the potential of chatbots and hence they are devotedly contributing to the growth and development of our bot friends. With technology advancements fueling the growth, bot technology has come a long way indeed. From simple menu/button-based chatbots to contextual AI chatbots, we have the luxury of options to choose from. Albeit we use and interact with a chatbot many a time, we may not be aware of its basic terminology and working. Let's clear the air around the chatbot buzz.

What is a chatbot?

Chatbots are small computer programs used to simulate the method of human conversation and interact with real people automatically to help them with their issues and complete their tasks. Chatbot marketing may have thrived over the past several years but bots have been around for some time now. The concept dates back to 1950 when Alan Turing published his seminal paper on artificial intelligence, Computing Machinery and Intelligence. Developments and advancements on the concept led to ELIZA, a simple program given birth in 1966 by Joseph Weizenbaum. Since then, the growth in chatbot technology has only seen the rise and surprised us with its potential in improving sales and marketing.

What is a chatbot script?

Chatbot scripts can be defined as pre-planned conversational messages which the bot answers as a response to a user's query. Depending on the choice and intention of the user, the bot will follow a specific conversational flow. All responses in the flow combine to make up the script. A chatbot script is vital for a conversation. The script of a chatbot depends on business goals and the buyer journey. There are some points to be considered while writing a chatbot script:

• Be focused on your goals
• Keep it short and simple
• Be clear in what you convey
• Be natural and not robotic
• Alter your responses

Your chatbot script and responses also depend on what type of chatbot you are implementing which brings us to our next section.

Chatbots: Types

To think that all chatbots are similar in their workflows and processing is incorrect. Thanks to deep and extensive research on bots, we now have a number of chatbot types to choose from. Some business tasks can easily be carried out by basic bots while some of them require advanced bots.

What should you look for in a conversational commerce strategy?

• Drive Efficiency. Get consumers answers in real-time, in the context, they are shopping in from the internal teams most equipped to answer them.

• Retain Attention. Keep shoppers on the product detail page rather than losing them to search, a competitor's products, or another retail site.

• Speed Time-to-Checkout. Give shoppers the confidence to buy, addressing issues quickly, and directly.

• Build Trust and Loyalty. Provide help and assistance that make it as convenient and frictionless as possible for consumers to shop with you so they return for repeat purchases.

• Learn from Customers. Take the opportunity to adapt and optimize existing product content to address the most common questions and pain points from shoppers.

Students' Articles

1. OLD AGE HOME

She was a mother, oops sorry she still is!
He was a father, oh yes he is still!
But the lovely spot for their children is now empty to fill
they don't know what sins they have done to be treated like that,
to get kicked out of an apartment, they made for their loved ones,
and which theythemselves owned once, in fact.
They feel so bad for their loved ones who did this to them
but they still pray that god don't u worry they are just kids they
don't know what they are doing here,
give all the sins to me which are done by my dear.
I will die anyhow but give him peace in his life,
bring a lot of happiness to him and his wife.
I have nurtured him well but I wish he too would have done the same
but it's ok he is just a child
I don't really want any fir against him to be filed
ohh let him live and let me die
if he lives happily I don't have to cry
all my life what I wanted to be was him happy
so what if he gets it by making me leave,
if he is happy I'm happy and so is his father.
But I really would have loved it if we were happy together

Rohit.H.Singh

2. THE GIRL IN THE RED DRESS

The girl in the red dress...
What do you think of a girl in the red dress?
she stands straight and tall when Grounds threaten to shift,
the girl in the red dress.
She doesn't look away even when a thousand gazes point her way,
the girl in the red dress.
Her voice never wavers when questioned with a million doubts,
the girl in the red dress.
She commands an army of Men facing hits head-on with them,
the girl in the red dress.
The same hands which destroyed tyrannous reigns,
nursed tenderly a sparrow to health,
the girl in the red dress.
The world witnessed her standing strong and firm, shouldering mountains...
But today she lies there broken not for her weakness but for her strength,
the girl in the red dress.

Nairuti Mehta

3. KUCH DUR ME CHALUNGA...

Kuch dur me chalunga kuch dur tu chal dena
Kabhi me tera sahara ban jaunga kabhi tu mera ban lena
Kabhi me tere peeche chup liya karunga kabhi tu mere peeche panah le lena
Kabhi tu mere, kabhi mai tere dil ki daat bol diya karunga
Kabhi tu mere liye khush ho lena, to kabhi mai tere asun poch diya karunga,
Kabhi tu mujhse baten kar lena, to kabhi kabhi mai tujhe hasa diya karunga
Kabhi tu mujse naraz ho jana, to kabhi mai tujhe mana liya karunga
Kabhi tu soch lena nahi to mai milne ke bahane de diya karunga
Kabhi tu mere liye dua mang lena, kabhi mai tere liye dua kar liya karunga,
Vo naubat kabhi naa ae par aaii to...
Kabhi tu mere liye kurabani de dena, to kabhi mai tere liye de diya karunga
Neend na aii tooo...
Kabhi tu mere kabhi mai teri god me so liya krunga
Accha wakt aega to...
Kabhi tu meri hasi ban jana mai teri muskan ban liya karunga
Bure wakt aenge to...
Kabhi tu meri jeene ki vajah ban jana, kabhi mai teri ban liya karunga
Kuch ke paise khatam nhi ho rhe, kuch gin gin ke rotiyan khate h,
Kuch ke sir par chaaat nhi, kuch divaron pe picasso lagate h,
Kuch ki baton me kal ki fikr hai, kuch sirf art farmate h,
Kuch apni tuti chappal chupae, kuch apne jordan sab ko dikhate h,
Kuch ko apne paise ka gurroor h, to kuch apne gareebe pe sharmate h,

Kuch ki pushton layak daulat dhari h,to kuch bas din katne jitna kamate h,
Kuch makhmali chadar odhe, to kuch thund me kapkapate h,
Kuch apne baccho ko kharch karna, to kuch bachana to chodiye,
seedhe kamanan sikhate h,
Kuch ke samne sarkaren jhukti, kuch har kisi ke samne jhuk jate h,
Kuch ke samne duniya gidgidaye, to kuch duniya ke samne gidgidate h,
Kuch ka shokh puri duniya manati, kuch gumnami me mar jate h,
Kuch ki rooh tak swarg nhi pohochti, kuch apni puri zindagi swarg me bitate h,
Mai amavas ko chand dhund rha,
Log bole aaj chand dikh jae ye vo raat nahi,
Mere liye ye koi baat nahi,
Vo pyar ka badal h, par mujhpe barse ye vo barsaat nahi,
Par sach batau, adat pad gai h,
Kyuki mere liye ye koi nai baat nahi.
Tu khush h par teri khushi me kisi aur ka h, mere haath nahi,
Par sach batau, tu khush h me khush hu,
Kyuki mere liye ye koi nai baat nahi,
Mere likhe khat, tujhe jhut lage,
Tujhe laga, kisi aur ke hai, ye mere jasbaat nahi,
Mujhe pata tha tujhe aisa lagega
Kyuki mere liye ye koi nai baat nahi.
Tujse sharma ghabra ke kuch ajeeb kar bol deta hu

Isliye sapne me jitni hasin thi utni hasin asal me apni mulakaat nahi...
Bachpan se nervous chal rha hu,
Mere liye ye koi nai baat nahi,
Tujhe mai harami lagta,
Par tujhe jitne lagte h utne kamine mere khayalat nahi,
Par sabko hi aisa lagta h,
To Mere liye ye koi nai baat nahi.
Vo Raja Hu jiski shayad rani pane ke aukat nahi,
To kya hua agar mere khushiyan aaj teri hasi se abaad nahi,
Raja hu, par rani harna shatranj me maat nahi,
Dekh Ro nahi rha mai,
Bas isliye ki tu kisi aur ke sath h mere saath nahi,
Kyuki sach batau
Mere liye ye koi nai baat nahi,

Rohit.H.Singh

4. घर से निकला मैं..

घर से निकला मैं.. ले के दो सहारे,
वास्ते मंजलिों के... रास्तों के सहारे...!
ना डगर को पता थी, ना हमको ख़बर..
बस मंजलिों के हवाले दोनों के सब्र..।
रास्तों के रुकावटों ने जब हमको डराया..
तो मनोरंजन करी उनसे और डर को हराया।
होसला हमने थामा और बढ़ते चले हम..
मंजलिों के इरादे हर अड़चनों से लड़े हम...
हवाओं से कर ली फरि हमने थोड़ी यारी...
कुछ उनकी सुने.., फरि कुछ सुने वो हमारी...
फरि बारी - बारी कई खुशी गीत गाए...,
और यू हमने मंजलिों से सुनहरे सफर को बनाए...!

Sujit Pandey

5. Don’t be bore...

Don’t be bore...,
This time is yours...
You feel the roar...
Cause you got to soar..
See, open every door..
Just push some more..
Think you are at an edge
Gaining should be more..
So,
your mind should be an empty store..,
Cause..
This time is yours..,
Just don’t be bore...
See, wasting of time isn’t a crime...
But you yourself could make things prime...
These stuff are so interesting,
Like more than time wasting...,
Of course, You’re unique..,
Play some trick,
Break the brick ..,
Cause you’re not at all sick..,
Every single effort has a kick...
So, instead of being bore..,
Try some more..!
Beat the limit,
Success will meet,
You’re more than fit,
JUST DO IT!

Sujit Pandey

6. Way Forward: Earn and Study

My experience at a store while shopping groceries one winter afternoon showed me the harsh reality of life.

At the billing section were two young men- honest and hardworking. It seemed their purchase exceeded the money they had on them together. They were trying to call someone to bring the remaining amount to conclude this shopping experience. They pretended to look for something on the stalls to add in their shopping cart.

They were embarrassed but also had accepted the situation, this might have happened before. My billing was taken up first and once the total was announced, I pulled out a 500 rupee note from my wallet. They exchanged quiet looks, which made me uncomfortable. My mother gave it to me of the intent to buy groceries that day.

While I walked back home, many thoughts came to me- what if I never get a job like my parents?, Will I be able to provide for myself as my parents do now?, Is it a boon to have money to buy whatever and whenever I want or rather a bane that arrests my competency required to get myself a good job?

Well, I was sure of one thing that this event had changed my perception of money and skyrocketed my anxiousness of the future.

Sriya Vaishnav

Technical

Department's Achievement
The NASA Space App Challenge 2019

The Challenge

NASA's International Space Apps Challenge is the world's largest global hackathon, engaging thousands of citizens across the globe to use NASA's open data to build innovative solutions to challenges we face on Earth and in space. Each year, Space Apps engages thousands of individuals in cities around the world to work with NASA's open-source data in a 48-hour sprint. Teams of technologists, scientists, designers, entrepreneurs, artists, and others collaborate to answer some of the most pressing challenges on Earth and in space.

The Event

NASA's International Space App Challenge 2019 was a 48-hour contest that took place across various cities in altogether 71 countries. The event lasted from 18th to 20th October 2019, in Noida. Day 1 of the event saw the registrations of all participants along with the Inauguration by guests in the auditorium hall. Later, a brief introduction to the Space App Challenge was given, followed by Team introduction and Elevator Pitching. After the lunch break, the teams were given sufficient time to work on their ideas. Day 1 ended with each team networking and prototyping their ideas. Without further ado, day 2 picked up right after day 1's agenda where each team's prototype was passed through the first round of scrutinization. After lunch, the final pitching commenced. Day 2 ended with the Awarding and Closing ceremony.

The Project

"Design and Development of motor speed controller using BLDC hub motor for two-wheeler" was the chosen topic for NASA's Space App Challenge.

The project involved using a motor controller (a device used to control the performance of an electric motor) with a bicycle to make an Electronic Bicycle or E-bike. A bicycle was used for this project because of its many distinct features like Lightweight, easy maintenance, and low-cost price. A bicycle is also very effective when moving in small distances. An E-bike would thus be a modified version of a regular bike, the difference being the application of a motor system, the use of a controller to control that motor system, and the use of a battery to power it. E-bike is better than a normal bike because a rider gets extra power when needed.

Here, the driver has an option when they are tired and unable to drive easily forward, on a long uphill or difficult road, to turn on the battery and trigger the engine. The motor then compensates for the power required and this way the entire route is smoother. Since it is up to the driver to turn on the power, the engine could be used for the entire trip or only for a short distance.

The Participants

Participants are Payal Narvekar, Richa Pandey, Anushka Sawant of BE and Sriya Vaishnav of TE Electronics from Thakur College of Engineering and Technology partook in NASA's Space App Challenge 2019 with their innovative concept of using an electric motor to transform an ordinary bicycle into an Electronic Bicycle. They were constantly guided and motivated by Mr. Hemant Kasturiwale (Internal Guide) and Dr. Sandhya Save (HOD ELEX) for the timely completion of their project. It is with everyone's immense efforts that they could grab the **Top 6th place in Maharashtra.**

IoT: Revolutionizing the World

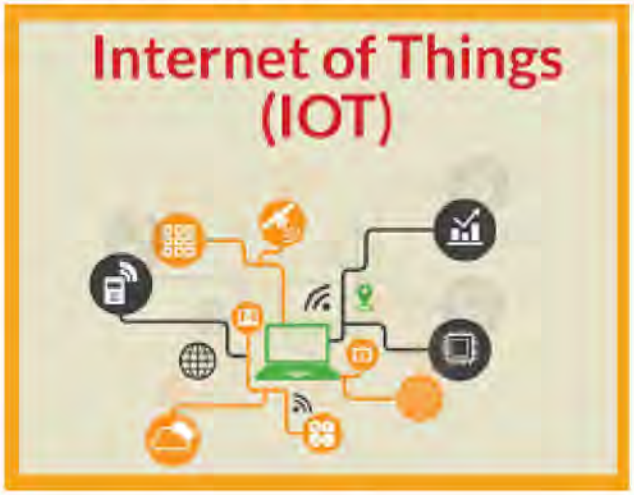
Jayank Panchal

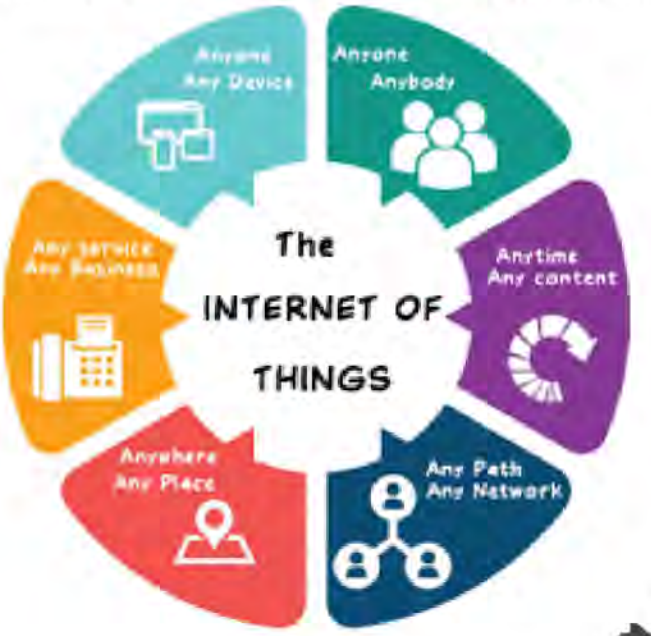
Imagine the Period of the Industrial Revolution, what if someone from that period of time had said that one day we will work on things which will be controlled by an entity called as the Internet, well he would be definitely be called as a madman; But today decades after the Industrial Revolution, here we are in an era which is governed by the Internet and going towards the era of Internet Of Things or which is popularly known as IoT.

Have you ever felt the need of the things that you used daily to be controlled by you by a single command!!, Of course, you have, we all have at some point in our daily routine, so keeping in mind these needs, researchers and developers have put their brains together created a world of the internet where we can transfer out our data to the server and the same can be used by another person who is at a different geographical location, that world of internet is nowadays known as Internet Of Things(IoT).

The term IoT was coined by Kevin Ashton during a presentation given by him to Practor&Gamble(P&G) in 1999.

To define IoT in simple terms or in layman's language: IoT is simply the interconnection of things over the Internet. Whereas the proper definition of IoT can be stated as IoT is a system of interconnected/interrelated devices that can vary from being a computing device to mechanical machines, these devices are provided with unique identifiers and the ability to transfer their data over the Internet without human intervention.





IoT uses the following type of communication more often:

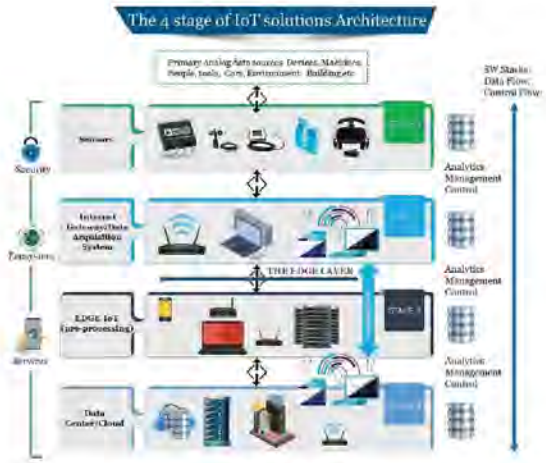
People to People Communication(P2P).

People to Machine Communication(P2M) or vice-versa.

Machine to Machine Communication(M2M).

Out of the above 3 types of communications used by IoT, the type3 or M2M communication is used by many industries to send the values of their devices from one place to another.

The structure of IoT depends on 4 stages, various developers users different naming of these stages but their work remains the same.



The various stages which are involved in IoT architecture are as follows:

Stage1: Sensors/Actuators-

This is the basic stage for an IoT driven design cause in this stage the machine collects various data with the help of sensors installed in the device.

Stage2: Internet Gateways/Data Acquisition System

This is the stage where the data which are collected are been transferred by using one of the technology in this layer i.e WiFi, TCP/IP, Zigbee, Bluetooth, LAN, WAN…etc.

Stage3: Pre-Processing

In this stage, the data which are sent to the cloud is being processed into systematic values.

Stage4: Cloud

The final stage of the architecture involves the place where the data is being stored it can be a Cloud or a server as well

There's one more term which has risen quickly in recent times, it is the IIoT or the Industrial IoT i.e the IoT technology used by the various Industries. This IIoT is becoming a trend nowadays as all the companies in the market are taking the help of IoT to expand the Business reach on a global level.

As the IoT comes with a lot of advantages, there is also a constant fear of the data that is being stored in the cloud to be taken away by illegitimate means i.e data theft.

So to keep our IoT systems out of these security holes, we have to identify and solve these threats and challenges.

The various threats that IOT posses are:

- Lack of Security to the data
- Compromization of IoT devices
- Conscription of IoT devices into Botnets
- Use of Default/Hackable Passwords
- Leakage of Personal/Sensitive/Confidential Information
- Remote Vehicle Access
- Ransomeware
- Data Theft

Below are some pictures of the device designed by me as a part of my Project:

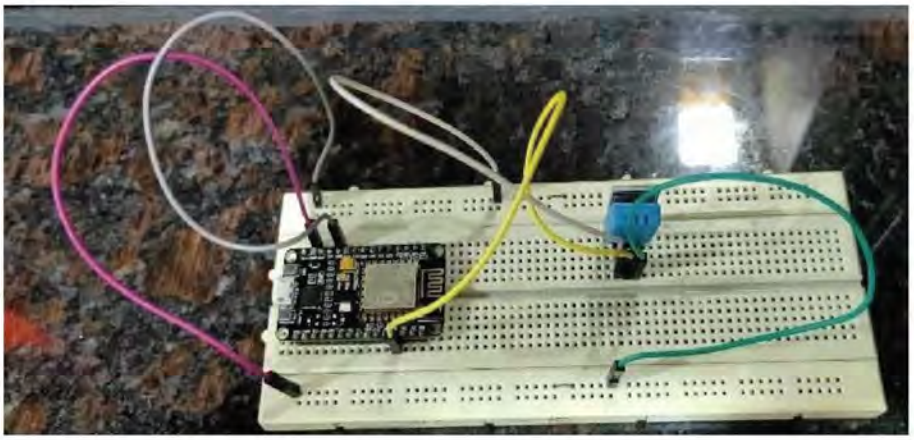


fig: Interfacing of DHT11

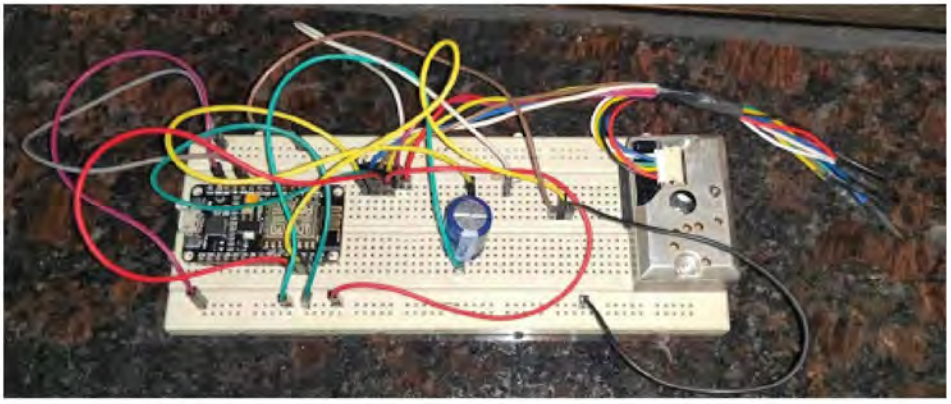
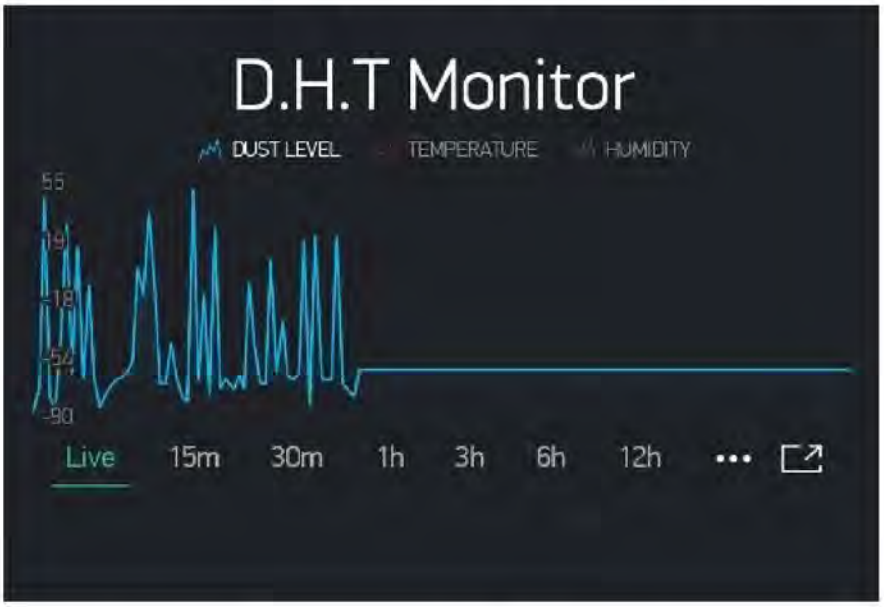


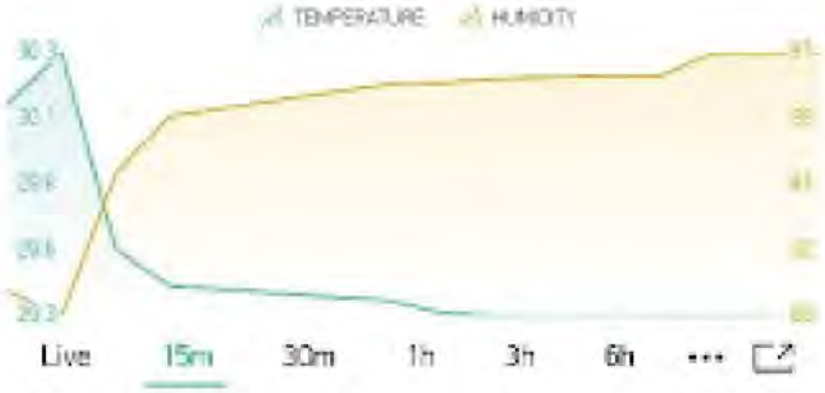
fig: Interfacing of Dust Sensor

1. Display of values of the sensors through Gauges

2. Graphical Representation of the variation of Cotton Dust



3. Graphical Representation of the variation of Temperature and Humidity



“Con-wheel”

Convertible Smart wheelchair for Disables

Ms. Poorva Waingankar Jay Mehta Kshithij Shetty Dishant Doshi

Abstract – This paper deals with various features that are implemented on the advance version of wheelchair. The advance wheelchair is electrically powered and is controlled by the use of a joystick and panel for a better movement of the chair. As observed that moving the patients from wheelchair to stretcher or to the medical bed is always a problematic issue for the caretaker. There is a revolution of wheelchairs available today driven by needs and desire of man. The “Convertible Smart Wheelchair for Patients” facilitates the disabled patient’s mobility .The purpose of this design is to convert wheel chair into reclining bed and also reduce the effort of the caretaker. It will provide a safer transfer of the patients in hospitals as well in places depending upon the need. The aim is to make a wheelchair which is light in weight, low cost of maintenance and durable. For example using of ABS plastic or optical fiber can be a good option as both are durable, less weight and requires low cost of maintenance. The smart features of this system are Ultrasonic Sensors, Diabetic Sensor, Body pulse rate sensor, Blood pressure sensor, Biometric sensor to start the vehicle, Thermo gun, Lipid sensor, and Vitamin level sensor. This will facilitate medical aide to patient and can communicate also with medical professional.

Keywords—ABS plastic (3D printing material), HaWCos - Hands- free Wheelchair Control System., ADC – Analog to digital.

1. INTRODUCTION

Several studies and surveys have shown beneficial results in the use of a smart wheelchair, this helps in the increase of independent mobility of both children and adults. The human which cannot physically transport himself from one destination to another always requires the need for a helping hand. The use of a smart wheelchair helps in the reduction of dependence of caregivers or family officials and helps in the promotion of feeling of self-reliance. For young adults, this independent mobility helps in creating a base for early learning. This smart wheelchair helps to increase opportunities for being self-dependent.

The main part of this paper is concerned with the newest version of the "Hands- free Wheelchair Control System" (HaWCoS), which is based on the detection of intentional muscle contractions. Unlike its predecessor, the new (extended and enhanced) implementation of HaWCoS has been realized as a stand-alone device that does not depend on the use of a laptop computer. After a basic reiteration of the muscle-based control principle, the hardware of the stand-alone device as well as the underlying software is presented in thorough detail. To make a copy of the prototypical device readily available to, for instance, the wheelchair manufacturer, the system has also been implemented edasa Windows executable with identical program behavior (running on any standard laptop) – a short description of this simulator follows the introduction of the stand-alone device.

The wheelchair is the mechanical equipment that is used for traveling of the person from one place to another. This facility was made for the person who can't walk due to some injuries/physical disabilities.

Fig 1: Ordinary Wheelchair [1]

The ordinary wheelchair needs manpower to drive as per need. The ordinary wheelchair ranges from 8k to 44k. Though there are many developments in science and technology the biomedical field is lacking behind in some sectors for example for the people who are physically challenged or due to some injuries or illness.

Smart Wheel Chair is mechanically controlled devices designed to have the ability to move or be moved freely and easily with the help of the user command.

This reduces the user's human attempt and force to drive the wheels for a wheelchair. Furthermore, it also provides an opportunity for visually or physically impaired persons to move from one place to another. The wheelchair is also provided with an obstacle detection system which reduces the chance of collision while on the journey. As it has gained a lot of interest in recent times. The machines can also be used in old age homes where the old age persons have difficulty in their movements. The devices serve as a boon for those who have lost their mobility (Injury or physically challenged). Different types of smart wheelchairs have been developed in the past but the new generations of wheelchairs are being developed.

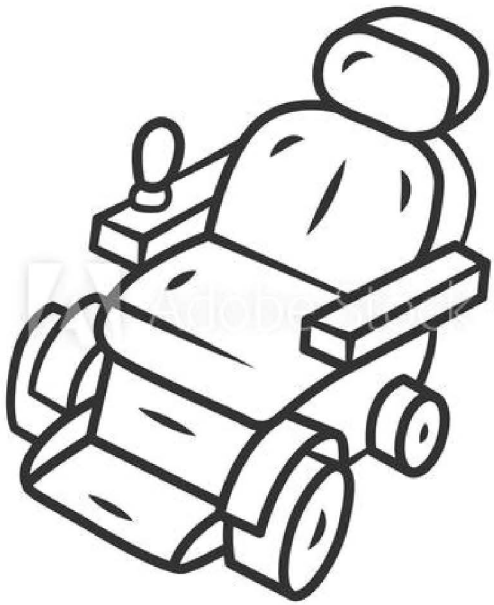


Fig 2: Modified Wheelchair (Smart Wheelchair) [3]

Sr No.	Ordinary Wheelchair	Modified Wheelchair	Future Modification
1	8k – 44k	50k – 75k	85k – 1.5lakhs

Table 1: Comparative analysis of the cost of the wheelchair.

The above table shows the cost of the Wheelchair varying from an ordinary wheelchair to a future wheelchair. These are the estimated cost.

Use of the Wheelchair (Flow of the application)

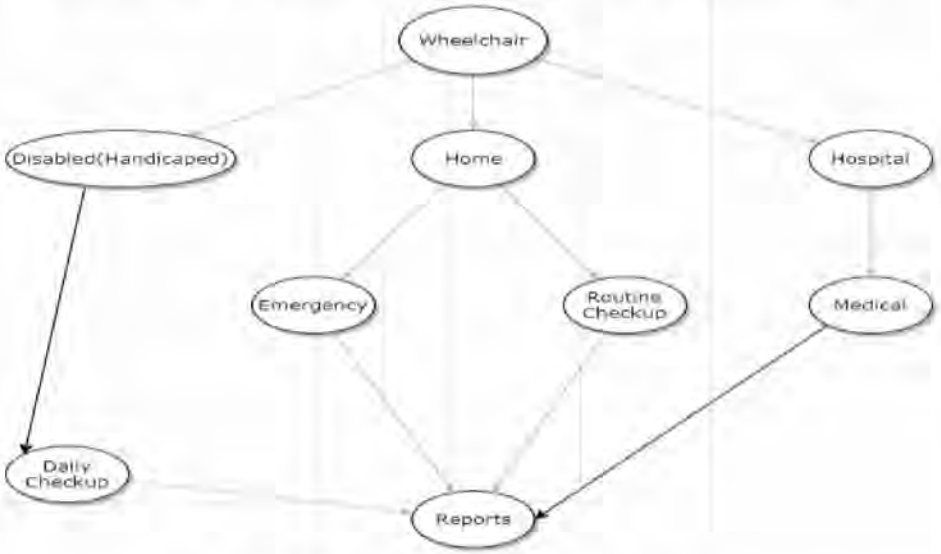


Fig 3: Flow of the application

A wheelchair can be mainly used for medical purposes in hospitals, homes, disabled people for emergency purposes and routine checkup the daily checkup of the disabled people and the reports will be sent to the doctor using the gsm model. If an emergency case occurs then the SMS will be sent to the hospital.

2. THEORETICAL FRAMEWORK

A smart wheelchair is electrically powered so the wheelchair is started by placing our palm on the biometric sensor. This wheelchair also has an alternating way of starting by entering the default pin on the keypad. Starting from the top section it has a headrest that provides comfort and a better posture for the person operating it. The smart wheelchair also has a convertible bed it is also called a smart bed for patients. This bed is introduced since all the people cannot be transferred from bed to chair or vice-versa. Coming to the operating part there are two ways of operation; one is an ordinary joystick and the other is the keypad. This is placed on the hand rest. The right-hand side of the chair consists of a joystick.

The left-hand side of the chair will contain the touchpad which will be having the buttons which will work according to the commands. The sensors such as heart rate sensors, pulse detecting sensors, blood pressure, measuring sensors, diabetic sensor, lipid sensors will be connected to the wheelchair. The touchpad will be assigned with the buttons which will help to scan each body part of the patient. The records will be stored and using the GSM model the message will be sent to the mobile of the family members of the respected patient. The ultrasonic sensor will be connected to the front of the chair to detect the obstacle if any. The hub motors and wheels will be used to move the chair. When the chair is in moving the battery is attached which will help the motors to move the plug will be added when the chair is in rest mode or sleeping mode the plug connection is used to work all the sensors To save the battery. The laser scanning will be connected behind which will scan the body when the buttons are pressed. The daily routine check of the patient is taken and the body of the patient is under scan 24/7 if any emergency is found the SOS text is directly sent to the ambulance and the help is called, with the details what the patient is suffering from to make the equipment ready in the hospital.

3. CIRCUIT IMPLEMENTATION

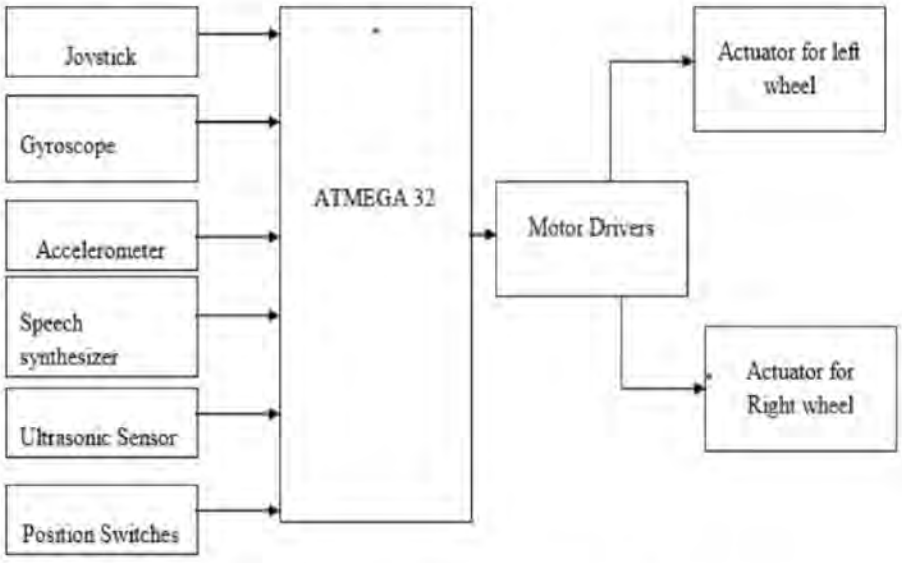


Fig 4: Proposed Block diagram of System

The above block diagram describes the circuit implementation of software and hardware circuit implementation of the system.

The inputs to the Atmega 32 are as follows:

Accelerometers:

The accelerometer Sensors are mounted on a headphone and they transducer change in acceleration of head movement to a voltage signal which is sent to the ADC input of the microcontroller.

Joystick:

The outputs of the two variable Resistor of the joystick are connected with the two channels of ADC.

Accelerometer

Speech Synthesizer:

Speech synthesizer Module works by giving user input voice command and send a signal to actuators.

Ultrasonic Ranging Module:

It is used to detect the obstacle. It is used to halt the wheelchair.

Gyroscope (L3G4200D):

Gyroscope compares input demand from a joystick, accelerometer source with the direction that the wheelchair is tracking. When the system detects that the wheelchair is deviating from the intended course of the direction it automatically corrects the path of travel.

Position Switches:

These switches are attached at the chair, to switch the input control unit as Speech or Joystick or Accelerometer.

Microcontroller:

It is the main computational and processing part of the Smart Wheel Chair that takes input from the sensor, processes it, and gives an output. It operates at a high frequency of 12 MHz and acts as a control center for the robot.

Relay Switch:

A relay is an electrically operated switch. Many relays use an electromagnet to operate a switching mechanism mechanically. It is used to switch on or off electrical circuits operating at high voltage using a low DC control voltage.

Motor Drivers:

Motor Drivers amplify the TTL output of the microcontroller such that it can drive the respective actuators. L293D IC is used for the switching the relay driver.

4. FUTURE SCOPE

The future advancement of the wheelchair is possible by increasing the battery size and automatic charging of the battery by the motion of the wheels. The system can also be operated with the help of phones or other devices. Optical sensors can also be used for the movement of the wheelchair. Extra sensors can be added such as heartbeat sensors, line followers can also be used to move the system in a particular area.

5. CONCLUSION

Con-wheel is not just an ordinary wheelchair but a wheelchair with advance features implemented on it. This system is designed with the help of electronic components controlling the actual movement of the wheelchair rather than an ordinary wheelchair which requires strong manpower to operate. The main focus of developing this system is to help the disables to be self-reliable as in this busy world waiting for assistance in making a person fully dependent on them and this system tries to avoid such circumstances. The con-wheel introduction to the world will be a great advancement in medical support facilities and will make the ordinary wheelchair to a wheelchair making a person self- dependent and help them to overcome the curse of disability.

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Mythology

THE OLYMPIANS

According to the Greeks, at the beginning of time there wasn't much around. The first god was said to be Chaos-a gloomy mist containing all the matter in the cosmos. Eventually some of Chaos's matter collected and solidified into the earth, which later on developed a living personality, called as Gaea, the Mother Earth. In a similar fashion, Ouranos, the sky was formed above the Earth like a protective dome, which was blue in the day and black at night. Gaea and Ouranos got married, leading Gaea to give birth to the 'First Generation' of TITANS. Meanwhile, the god Chaos kept on procreating in itself, giving rise to Water (the god Pontus), Tartarus (the Pit of Evil), Nyx or Night, Hemera or Day (daughter of Nyx) among thousands others.

The first generation of Titans consisted of six girls and six boys. The girls were: Theia, Themis, Tethys, Phoebe, Mnemosyne and Rhea; the boys were: Kronos, Oceanus, Hyperion, Koios, Krois and Iapetus. After a series of events Kronos, the youngest of the twelve siblings, was bequeathed with the title of the 'Lord of the Universe' for murdering his father, Ouranos. Kronos was also the Titan of Time. He later married Rhea, the Titan of Motherhood, who gave birth to The Olympians or popularly known as The Greek Gods.

When Kronos had ambushed and murdered Ouranos with the help of four of his brothers, he was subsequently cursed by Ouranos. The curse was that the same fate would be bestowed upon Kronos by his own children. As a result Kronos lived in a constant fear of being killed by his own child.

Later when Rhea had given birth to his first child, Kronos had hoped for a healthy Titan baby. But Hestia, his eldest daughter, was unlike any Titan kid, she was smaller but stronger than a Titan. In a sense, Hestia was an evolved version of a Titan. Fearing that the curse was about to come true, Kronos did a very deplorable thing- he swallowed the babe in his arms.

The same was done for the four consecutive children to be born. Rhea, who was by now completely distraught, gathered enough courage to finally seek some help from Mother Gaea, when she got pregnant for the sixth time.

Gaea who had been slumbering deep in the Earth advised her daughter to head to the 'Island of Crete' to give birth to her sixth child.

When the baby was born, Rhea left the baby boy in the care of some helpful nymphs and returned empty-handed to the palace. Knowing Kronos's routine by heart, Rhea simply handed him a rock of a similar size and weight as that of a baby, swaddled in blankets. Kronos swallowed the rock without a sparring glance.

Now, as the gods were born immortal, swallowing would only prove to immobilize them and thus would not be fatal. Meaning, all this time the gods had been slowly maturing inside Kronos's belly. To get them out, Rhea along with her youngest son 'Zeus', hatched a plan to do so. The plan was to get Zeus to infilter the palace staff and poison Kronos's drink, causing him to barf up all the gods.

The plan succeeded and Kronos ended up upchucking five disgorged gods, who immediately grew to full-size adults' right there. The order in which the gods where chucked out later replaced the order in which they were born. Zeus followed by the just released gods made quick escape before Kronos or the other Titans could recover from the poison in their drinks. Kronos, enraged, ordered the Titans to scour the earth and bring the gods either in chains or in small pieces.

The six Greek gods had temporarily hidden themselves at Mt Ida, located at the Island of Crete. Knowing they couldn't hide for long, the gods decided to engage in a battle with the Titans. But first they needed weapons! So a trip was made to Tartarus, where the Hundred-Handed Ones and the Cyclopes were enslaved, who too conveniently held a grudge against Kronos and agreed to partake with the gods.

The Hundred-Handed Ones and the Cyclopes were the children of Gaea and Ouranos, siblings to the Titans. Albeit unlike Titans, they were born physically deformed and despicable in appearance. The Hundred-Handed Ones had literally a hundred hands jutting out of their torsos while the Cyclopes had only a single eye, they were both enormous in size. However, what they lacked in appearance they completely made up for at raw talent. The Hundred-Handed Ones were excellent stonemasons while the Cyclopes were excellent blacksmiths.

The Cyclopes forged 'The Lightning Bolt, The Trident and the Helmet of Death and Destruction (which could render the wearer invisible)', which were claimed by Zeus, Poseidon and Hades respectively. Armed with these strong weapons the gods declared war upon the Titans. By most accounts, the Titan War took about ten years. During these years many Titans sided with the gods, convinced by Rhea or impressed by the gods' powers.

As the battle continued, the gods made Mt Olympus their war base which wasn't as tall or popular as Mt Othrys (where Kronos's palace was located) but was located nearby. The gods fired missiles and boulders from their place at Mt Olympus and surprised attacked Mt Othrys, thus destroying the enemy palace. Kronos, as was his fate, was sliced up to smithereens by Zeus and thrown into the deepest pits of Tartarus.

Today, Mt Olympus is the tallest mountain in Greece as it is believed that Mt Othrys was almost halved its size due to the destruction caused by the gods. After the war was over the gods decided to make Mt Olympus their residence and thus begot the name Olympians.

Together the Olympians ended the Age of Titans and a new of era of the Olympian gods begun.

The OLYMPIANS in the order of their birth are as follows:

The first generation,

1. Hestia (Goddess of the Hearth)
2. Demeter (Goddess of Grain and Agriculture)
3. Hera (Goddess of Marriage), Zeus's wife
4. Hades (King of the Underworld), isn't actually considered an Olympian
5. Poseidon (God of the Sea)
6. Zeus (King of Gods, God of Lightning)

The second generation,

7. Athena (Goddess of Wisdom and Warfare)
8. Aphrodite (Goddess of Love)
9. Ares (God of War)
10. Hephaestus (God of Fire and Crafts)
11. Apollo (God of Archery, Music, Prophecy and Healing)
12. Artemis (Goddess of Hunt)
13. Hermes (God of Trade and Travel)
14. Dionysus (God of wine), takes Hestia's place as an Olympian

Greek Mythology Family Tree

The Primordial Deities


Chaos


Tartarus


Gaia


Eros


Erebus


Nyx


Nesoi


Ourea


Pontus


Uranus


Thalassa


Aether

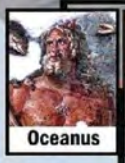

Hemera

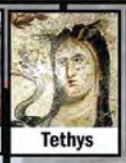

Nemesis


Thanatos


Hypnos

The Titans


Oceanus


Tethys


Hyperion

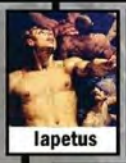

Theia


Coeus


Phoebe


Cronus


Rhea


Iapetus


Crius


Themis

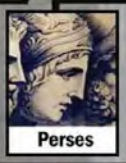

Metis


Eos

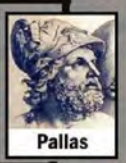

Selene

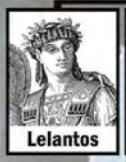

Helios


Mnemosyne


Perses


Astraeus


Pallas


Lelantos


Asteria


Leto


Menoetius


Epimetheus

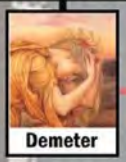

Prometheus


Atlas

The Olympians


Hades


Hestia


Demeter


Zeus


Hera


Poseidon

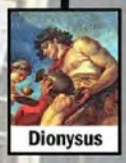
Dione

Semele

Maia


Athena


Aphrodite

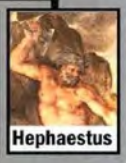

Dionysus


Apollo


Artemis


Persephone


Ares


Hephaestus


Hermes


Pan

Parent child relationship

Consort / lover relationship

Interview

HIGHER STUDIES CENTRED INTERVIEW

MRS.ROOHI MEHTA (M.Tech & B.Tech (EXTC)) **DATE: 2/4/2020**

1. Nowadays most of students with engineering background, irrespective of their branch choices opt for higher studies, as you've watched several batches pass out what can be reason behind it ? Low chances of placement back home or is it to Upscaling their skillsets or can it be both?

➞ Basically why the students are doing so is, outside of India they have one plus point that is their quality of life, whereas in India we don't have it. They respect individuals more, these types of things are valued outside. That is one of the very important point. Secondly of course as far as education is concerned, outside India there's more practical oriented education system. Thirdly, and so far most important point for students is that students have a control of their own lives, they become fully independent. Over here what happens is that they're chaperoned over by their parents for everything, there they get to control get to manage their lives and that is what teaches them to be independent, they get a lot of exposure which is again a good thing for them. Just by staying in India, in one city one really won't get that good exposure, which is why when you go abroad for higher studies you meet people from different parts of world because of which you get better understanding better opportunities and makes you a better learner which won't be possible staying back in India. Students learn to involve their Head, their Heart and their Hand. These 3H's of life when put together actually makes you a successful person.

2. As students aspire to go for higher studies not everyone has strong financial backbone as such. What types of scholarship are available for them today?

➞Nowadays we do have some good loan systems available for Indian students. In countries like Canada, where population density is very low, they need more people to come there and work. Once education is done you can easily apply for PR(Permanent Residency) there. Once you become their citizens you can enjoy all the benefits of their system. Apart from that, back in India, higher education here is doing wonders. By engaging in courses like NPTEL lots of doors to Public Sector jobs have opened recently, there's a scope in such courses.

3. Almost Every person plans to give GRE/GMAT, when is the ideal time in a 4 year degree to start preparing for same?

➞Many a times this question is posed by students. In various orientations and lectures I have over and again mentioned clearly that an Ideal time for giving such competitive exams is at least 18 months prior to the time before you graduate. Because 18 months is the average processing time for the admission procedure ,if you want to avoid showing a gap in your application profile. It means that the moment you start your third year, you can start preparing for these exams. HOC cell conducts number of mock tests for you to practice for these exams by teaming up with coaching center's like IMS.

4. What are the leading countries Indian students choose nowadays as there's an Anti-West sentiment going on nowadays given the Looming economy and Growing national interests, issues like Trump... in countries like USA? Is east an option now?

➞ Don't go by just what you hear from others. Keep your eyes and ears open before believing what is simply said. When students hear one person going a particular place, doing a particular thing others blindly follow the same path, which is absolutely wrong. HOC cell organizes a number of seminar where people from host countries come and speak to you, you can clear your doubts by being present in those seminars that are conducted for you, for your benefit. Now, dream destination maybe US but there's already a heavy influx there, there are already many people there. There are countries like Germany, Singapore which lot of students don't know about which offer attractive options as a dream destination for higher education. But if student aims to settle in abroad, that is not to return to India after completing education, Canada can be a very good option for them due to ease of getting PR.

5. After giving GRE, How to prepare for a university interview? Does it differ for universities?

➞Every university has their own criteria, there's again a minimum CGPA you require for your application. Our country has no dearth of talent, there are extremely talented people who go and compete with the other countries talented pool for brilliant opportunities which are presented to them. Also, you've to be very confident of your skills, your projects. What I observe is not many students in the college stick to the same project. If, during the whole degree they develop the same project then they should continue to work on it, it would make a difference rather than just going on collecting certificates.

The one who's more passionate, more hardworking gets it. If you've technical knowledge, you should also know how to sell it.

6. Any tips for current batch going for higher studies?

➞A bachelor's degree may simply not be enough, it won't do wonders for you. Children instead of just getting degrees should learn the concept of 'Continuous Learning' that is a life-long learning process, it never ends- you go on learning without just learning to earn money. Remember the 3H mantra, they can do wonders in your life.

PLACEMENT CENTRED INTERVIEW

MR.SRINIVAS RAO (B.E MECH, IIMB (EXEC MBA)) **DATE: 5/4/2020**

1. What Kind of Attitude and personality you expect an interviewee to carry with him or her?

➞It is extremely important for an interviewee to be patient while appearing for an interview, also for any kind of conversation with upper-level people. Next thing that is important to be emotionally and mentally grounded.

2. What basic knowledge is expected from an interviewee with an engineering background?

➞The interviewee is expected to have good basics of their engineering core subjects. Along with this, it is essential for them to be abreast of the latest developments in their core subject and have basic knowledge of at least one of the technological trends. Let's say, an Electronics engineer should know about raspberry pi, Arduino.

3. In what ways are engineers different in other countries in comparison to India, if they are different? Should colleges and universities address that gap?

➞Yes, there is a huge difference in engineering colleges here and in other countries. They have more practical skills than theoretical knowledge, which is important in understanding things better. While we have a lot of theoretical knowledge than them, it is often not required.

This gap should be worked upon to increase the outcome of India overall. Think about it, with the present number of software people (since it requires hands-on experience) and jobs we have been able to mark a place in the world economy. If other streams also are given as much importance and provided with more practical skills in their fields, we will do excellent in most of the parameters that define a developed country.

4. Entrepreneurs in India are offered a lot of support from the government. How should students proceed with setting up their own business? Any tips to proceed with this field?

➞The present Government is providing a lot of benefits and support to people with an idea or start-up plan. So much so that free land, free water supply, and walk-in facilities across major cities. There are instances where people have had a meeting with a group of Government officials and according to your idea, on-spot money and other facilities have been assigned. It is all about the idea that you have.

I will not be able to speak in detail about this, but the government's website has all the details.

5. While selecting a branch to pursue engineering, parents have always considered the IT and computer fields which seem more job promising. There is also a belief that the software sector will replace other fields. Is this true?

➞There will never be such a case where all jobs will be replaced by IT and computer sector, never.

It all boils down to what students have to offer in their CV. Why should students follow the demands and not do want they want to study and pursue?

6. Any tips for students who will soon appear for interviews?

➞Your CV reflects a lot of your thought and personality, make it as best as possible. Also know your projects very well so much so that any question from the interviewer, will answer confidently. Whatever you have written in your CV should be true and must have either s proof or explanation for it.

Lastly, I wish all the students all the best and hope they make their dreams come true.

Environment heading to..

Nature's call

1. Indigenous people, making up <5% of the global population, protect over 80% of the world's biodiversity. If they're threatened, we are at risk!

2. We are facing the effects of climate change even at 1.3°C. The majority of the world alike is showing a lack of action. People (not everyone) make fun of the climate activists, who talk about reality.

3. Climate change causes more rain:

Higher temperatures mean water is evaporated at a higher rate, meaning the likelihood of heavy downpours, and possibly flooding events, is increased especially for low lying regions.

4. The sweeping response to COVID-19 demonstrates that we are capable of responding to a crisis, hence the climate crisis should be no exception.

5. If Climate Change is not declared a pandemic soon, huge repercussions are to be faced by future generations.

6. It is a fact that climate change and air pollution kill more people than Covid-19 ever will, yet we do not allocate equivalent media or political attention to it.

7. 80% of those displaced by climate change are women. Women and children are 14 times more likely to die in natural disasters. The facts are indisputable. It's time women had equal say in decision-making around climate change.

8. Morocco makes a new record with announced Noor Midelt Phase 1 multi-technology solar power plant - to be 1st in the world to produce solar energy at USD 7 cents/kWh.

9. India's state railways signed a preliminary deal with GAIL (India) Ltd to use natural gas in some of its operations, part of a drive by the world's third-biggest oil consumer to gradually shift to cleaner fuels.

10. Audi is committed to achieving CO2 neutrality at all Audi plants by 2025.